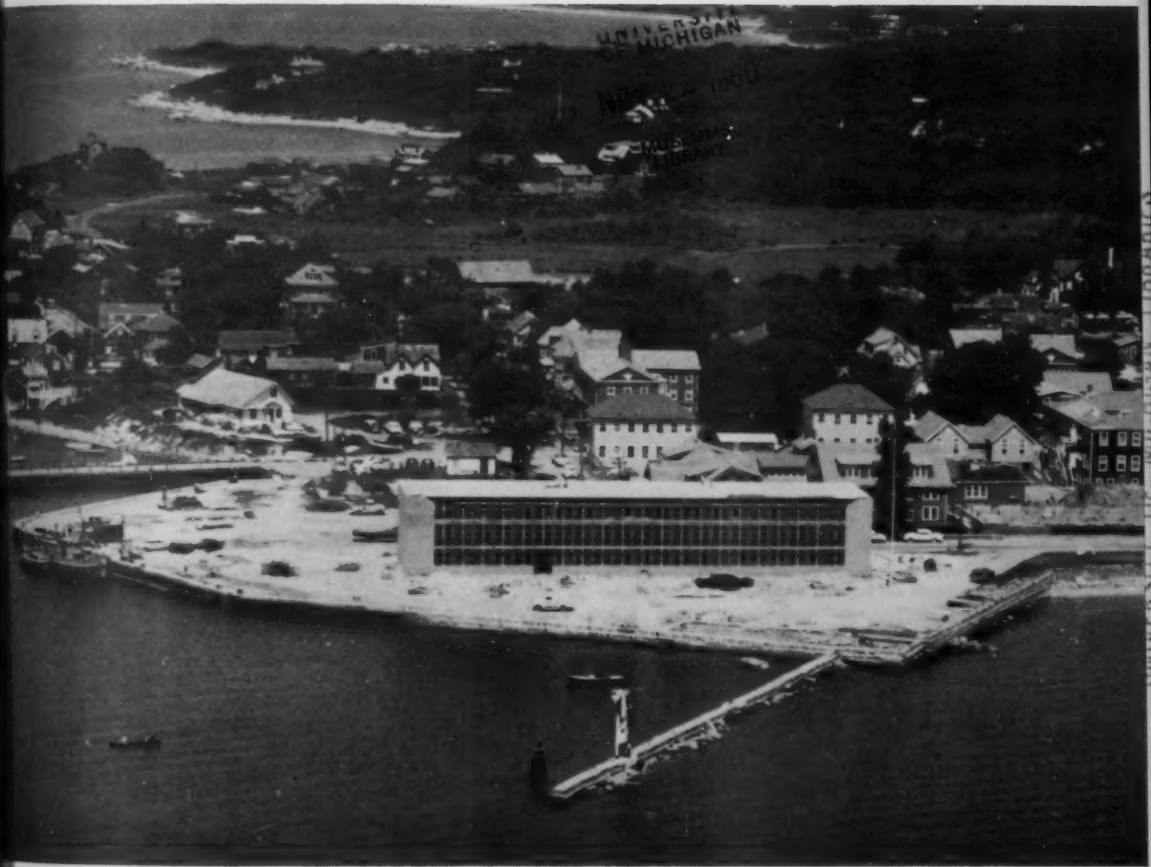


COMMERCIAL FISHERIES REVIEW



Vol. 22, No. 10

OCTOBER 1960

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

D
UNITE
D

to
W

re

re

B

Pa

1

Pa

2

2

2

2

2

2

2

2

3

3

3

3

3

3

3

3

3

3

DEPOSITED BY THE
UNITED STATES OF AMERICA

UNITED STATES
DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

FISH AND WILDLIFE SERVICE

ARNIE J. SUOMELA, COMMISSIONER

BUREAU OF COMMERCIAL FISHERIES

DONALD L. MCKERNAN, DIRECTOR

DIVISION OF RESOURCE DEVELOPMENT

RALPH C. BAKER, CHIEF



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

Publication of material from sources outside the Bureau is not an endorsement. The Bureau is not responsible for the accuracy of facts, views, or opinions contained in material from outside sources.

Although the contents of the publication have not been copyrighted and may be reprinted freely, reference to the source is appreciated.

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 10, 1960.

5/31/63

CONTENTS

COVER: The first--and oldest--Woods Hole marine research laboratory has been replaced by a modern three-story brick and glass building. It has ichthyological, biological, physiological, microbiological, shellfishery, chemical, and electronic laboratories, as well as a large number of tanks and tables supplied with tempered sea water, drafting shop rooms equipped for mathematical computations, library, conference hall, and offices. A vital part of the new laboratory will be the aquarium, with auxiliary facilities and shops, which is now under construction. This is one of several biological laboratories of the U. S. Bureau of Commercial Fisheries.

- Page
1 . . Development and Use of Otter-Trawling Gear for Red Snapper Fishing in the Gulf of Mexico, June 1957-May 1959,
by Francis J. Captiva and Joaquin B. Rivers
15 . . Structure of the Fishing Industry in the European Common Market, by P. Hovart

Page	TRENDS AND DEVELOPMENTS:	TRENDS AND DEVELOPMENTS (Contd.):
	American Samoa:	Oceanography:
27	Tuna Landings, July 1960	35 . . Charts of Eastern Pacific Ocean Floor
	California:	36 . . Survey of Pacific Ocean Area off San Francisco Under Way
27	Physiological Study of Pacific Salmon (M/V <u>Nautilus</u> Cruise 60N6)	37 . . Oysters:
27	Cans--Shipments for Fishery Products, January-June 1960	38 . . Mortalities in Chesapeake and Delaware Bays
28	Central Pacific Fisheries Investigations:	38 . . MSX Oyster Killer Identified as Animal Parasite
28	Studies Initiated on Genetic Definition of Tuna Stocks	39 . . Maryland Observations, 1960 Season
28	Federal Purchases of Fishery Products:	39 . . Virginia's Yield Per Acre Almost Treble That for Maryland
28	Department of Defense Purchases, January-June 1960	40 . . Long Island Sound Observations on Spawning and Setting
28	Fish Farming:	41 . . Underwater Harrow May Aid Starfish Control on Oyster Beds
28	Director Appointed for New Experimental Station	
29	Contact Let for New Experimental Station in Arkansas	41 . . Portion-Control Fishery Products:
29	Great Lakes Fisheries Exploration and Gear Research:	41 . . Use in Institutional and Public Eating Places
29	Exploratory Fishing with Otter Trawl Started in Lake Michigan (M/V <u>Art Swear II</u> Cruise 1)	42 . . North Atlantic Fishery Investigations:
29	Great Lakes Fishery Investigations:	42 . . Underwater Television Aids Biologists in Fish Behavior Studies
29	Chemical Control Program for Sea Lamprey on Schedule	43 . . South Atlantic Exploratory Fishery Program:
30	Experimental Trawling Reveals Spawning Success of Certain Species	43 . . Savannah River-Cape Hatteras Offshore Areas Surveyed for Fish and Shellfish Resources (M/V <u>Silver Bay</u> Cruise 25)
30	Lake Erie Fish Population Survey (M/V <u>George L.</u> May-June 1960 and July 1960)	43 . . Telephone and Telegraph Cables:
30	Lake Michigan Fish Population Survey Continued (M/V <u>Cisco</u> Cruises 4 and 5)	43 . . Charts Show Cables in Northwest Atlantic
32	Western Lake Superior Fishery Survey Continued (M/V <u>Siacowet</u> Cruises 3 and 4)	43 . . Tuna:
33	Gulf Exploratory Fishery Program:	43 . . Composition Studies
33	Trawl Fishing Gear Studied with Underwater Camera (M/V <u>George M. Bowers</u> Cruise 28)	43 . . Trolling Program Aids Pacific Coast Albacore Fleet
33	Market News Service:	44 . . United States Fishing Fleet Additions
33	Addition of Eastern Pacific Fishing Information to California "Monthly Summary"	44 . . U. S. Fish Meal and Solubles Production and Imports, January-June 1959
34	Market:	45 . . U. S. Foreign Trade:
34	Biological Laboratory Receives Grant for Research on Early Life History of Fish	45 . . Imports of Fish Meal and Scrap, 1959
35	North Atlantic Fisheries Exploration and Gear Research:	45 . . Edible Fishery Products, June 1960
35	Annual Overhaul of Fisheries Research Vessel <u>Delaware</u> Held Up by Freak Accident	46 . . Imports of Canned Tuna in Brine Under Quotas
		46 . . Export Expansion Program Aided by Export-Import Bank
		46 . . Washington:
		46 . . Salmon Planted by Hatcheries Expect to Set Record in 1960
		47 . . Wholesale Prices, August 1960

Contents Continued page II.

CONTENTS (CONTINUED)

Page	FOREIGN:	Page	FOREIGN (Contd.):
	International:		Japan (Contd.):
	Bering Sea:		Two More Tuna Motherships to Fish Fijian Waters
48 . .	U. S. Naval Observations on Soviet Fishing Fleets	56 . .	Frozen Salmon Shark Exported to Italy
	Fish Oils:	57 . .	Earnings by Catcher Vessels in North Pacific Mother-
49 . .	World Fish Oil Exports Set New Record in 1959	58 . .	ship Salmon Fishery
	Food and Agriculture Organization:	57 . .	North Pacific Mothership Salmon Fishery Season Ends
50 . .	Fish Farming Studies in Uganda May Increase Yield	58 . .	Increased Allocations for Salmon Roe Imports Proposed
	International Association of Fish Meal Manufacturers:	59 . .	Salmon Shark Exploratory Fishing Operation in North
51 . .	More Information on Hamburg Meeting	60 . .	Pacific
	International Commission for Northwest Atlantic	58 . .	Bristol Bay Fish-Meal Factoryship Production as of
	Fisherries:	July 31	
51 . .	Progress on Studies of Effect of Net Mesh Sizes on	61 . .	Fish Meal Prices
	Fish Stocks	62 . .	Factoryship Fish Meal to be Sold on Domestic Market
	Nordic Fisheries Conference:	63 . .	Fishing Companies Plan to Raise Poultry and Livestock
52 . .	Conference Met in Mid-August 1960	64 . .	King Crab Mothership Returns from Bristol Bay after
	Angola:	65 . .	Filling Quota
52 . .	Fishing Industry Faces Crisis Due to Low Fish Meal	70 . .	Herring-Crab Factoryship Reports Good Catches in
	Prices:	71 . .	Bering Sea
	Argentina:	70 . .	Six Factoryships to Freeze Flatfish in North Pacific
53 . .	Fish Meal and Oil Industry	70 . .	Sardine Canners May Have Trouble Meeting Contracts
	Australia:	70 . .	Fish Consumption Survey Shows Trends of Food Preferences
53 . .	Three-Year Shrimp Survey Ends	71 . .	Mackerel Fishermen Change to "Porgy" Long-Lining in
	British North Borneo:	71 . .	Marshall Islands
54 . .	Japanese Reviving Fishing Industry	71 . .	Oceanside Fishery Operations as of July 1960
	Canada:	71 . .	Soviets Observe Japanese Fisheries Closely
54 . .	Trawlers to be Permitted to Fish in 3-12 Mile Zone	72 . .	Trawlers Find Good Fishing off Foreign Coasts
	off East Coast	72 . .	North Pacific Whaling Operations, July 1960
55 . .	Lake Erie Smeat Trawl May be Adaptable to Sardine	72 . .	Whaling Industry Fails to Agree on Use of Former
	Fishery	73 . .	British Fleet
55 . .	Mechanical Digger Developed for Soft Clams	72 . .	Liberia:
	Cuba:	72 . .	Maritime and Inland Fishing Regulations Published
55 . .	Closed Seasons for Certain Shellfish Revised	73 . .	Mexico:
	Denmark:	73 . .	Shrimp Fishery Trends, Early August 1960
55 . .	Fisheries Trends, Second Quarter, 1960	73 . .	Fishery Products Requiring Import Licenses
56 . .	Expansion of Greenland's Fisheries Under	73 . .	Import Permit for Fish Meal Required
	Consideration	74 . .	Morocco:
56 . .	El Salvador:	74 . .	Fishermen Trends, April-June 1960
	Shrimp Fishery Trends, July 1960	75 . .	Netherlands:
56 . .	Fiji Islands:	75 . .	Withdrawal from Whaling Convention Approved by
56 . .	Tuna Cannery with Japanese Interests	75 . .	Parliament
	France:	75 . .	Two Bills on Whaling Passed by Second Chamber of
57 . .	Fish Meal and Oil Industry and Markets	76 . .	Norway:
	French West Indies:	76 . .	Fish Meal and Oil Industry
56 . .	United States Tuna Canner Interested in Building	76 . .	Exports and Imports of Marine Oils and Their Products;
	Cold-Storage Plant in Martinique	76 . .	Exports of Herring Meal, 1959
	German Federal Republic:	77 . .	Fisheries Trends, April-June 1960
56 . .	Technologist Develops New Method for Preserving	78 . .	Whaling Industry Trends, July 1960
	Fish at Sea	78 . .	Norwegian Company Sells Land-Based Whaling Station
	Greece:	79 . .	Panama:
58 . .	Freezer-Type Trawlers Report Good Catches in June	79 . .	Fish Meal and Oil Industry
	Sardine and Anchovy Landings Good in June	80 . .	Portugal:
58 . .	Greenland:	80 . .	Fishery Trends, July 1960
59 . .	Shrimp Industry Expands	82 . .	Fishing Industry Renovation and Reequipment Bond
	Guatemala:	82 . .	Issue Authorized
59 . .	Japanese Company Granted Permit to Fish off Coasts	82 . .	Fish Meal and Oil Industry
	of Guatemala	83 . .	Sierra Leone:
59 . .	Hong Kong:	83 . .	Fishing Industry Developing Rapidly
59 . .	Government Aids Fishing Industry	84 . .	Turkey:
	Iceland:	84 . .	Territorial Waters Limit Set for Navigation and Fishing
59 . .	Fisheries Trends, Mid-July 1960	84 . .	Union of South Africa:
60 . .	Herring Fishery Trends, July 1960	84 . .	Imports and Exports of Fishery Products, 1959
	India:	85 . .	Landings of Pilchard-Maaibanker as of June 30
60 . .	New Five-Year Plan Provides for Rapid Expansion of	85 . .	Exceeded 1959 Season Total
	Fisheries	86 . .	Union of South Africa and South-West Africa:
61 . .	Italy:	86 . .	Fish Meal and Oil Industry Trends, January-May 1960
61 . .	Fish Meal and Oil Market	86 . .	U. S. S. R.:
61 . .	Subsidies for Fishing Industry as of June 30, 1959	86 . .	Fishery Conference in Riga
	Japan:	87 . .	Fishing Fleet on Newfoundland Banks
62 . .	August Price for Frozen Yellowfin Tuna Exports	87 . .	United Kingdom:
	to United States Lower	88 . .	New Interest Rates on Fisheries Loans Effective June 20
62 . .	Base Price for Tuna Exports to Italy to be Reexamined	88 . .	Three Freezer-Type Trawlers to be Added to Fleet
	Italy Buys Frozen Tuna only in Small Lots	88 . .	Venezuela:
62 . .	Canners Having Trouble Meeting Contracts for	88 . .	Fish Meal Industry
	Lightmeat Tuna in Oil	88 . .	FEDERAL ACTIONS:
63 . .	Editorial Highlights Canned Tuna Export Problems	88 . .	Department of Health, Education, and Welfare:
	Fisheries Agency to Reexamine Tuna Fishery Policies	89 . .	Food and Drug Administration:
64 . .	Frozen Tuna Exports Lag	89 . .	Effective Date of Food Additives Statute is Extended for
64 . .	Market for Tuna Vessels Weakens	89 . .	Additional Items
65 . .	New Canned Tuna Product on Market	89 . .	Proposal to Add Certain Synthetic Flavorings to
65 . .	Purse-Seiners Demand Licenses for Tuna Fishing	89 . .	Substances Recognized as Safe
65 . .	Skipjack Tuna Landings Light in Kochi Prefecture	90 . .	Effective Date of Food Additives Statute Extended for
66 . .	Super Tuna Long-Liner Launched	90 . .	Synthetic Flavorings
66 . .	Tuna Fishing Vessel Sent to Okinawa in July		

Contents Continued page III (following page 117).

COMMERCIAL FISHERIES REVIEW

October 1960

Washington 25, D.C.

Vol. 22, No. 10

DEVELOPMENT AND USE OF OTTER-TRAWLING GEAR FOR RED SNAPPER FISHING IN THE GULF OF MEXICO, JUNE 1957-MAY 1959

By Francis J. Captiva* and Joaquim B. Rivers*

SUMMARY

The snapper fishery of the Gulf of Mexico, traditionally a hand-line fishery, recently has been faced with severe economic problems and has been seeking a solution through the development of more effective fishing gear and methods.

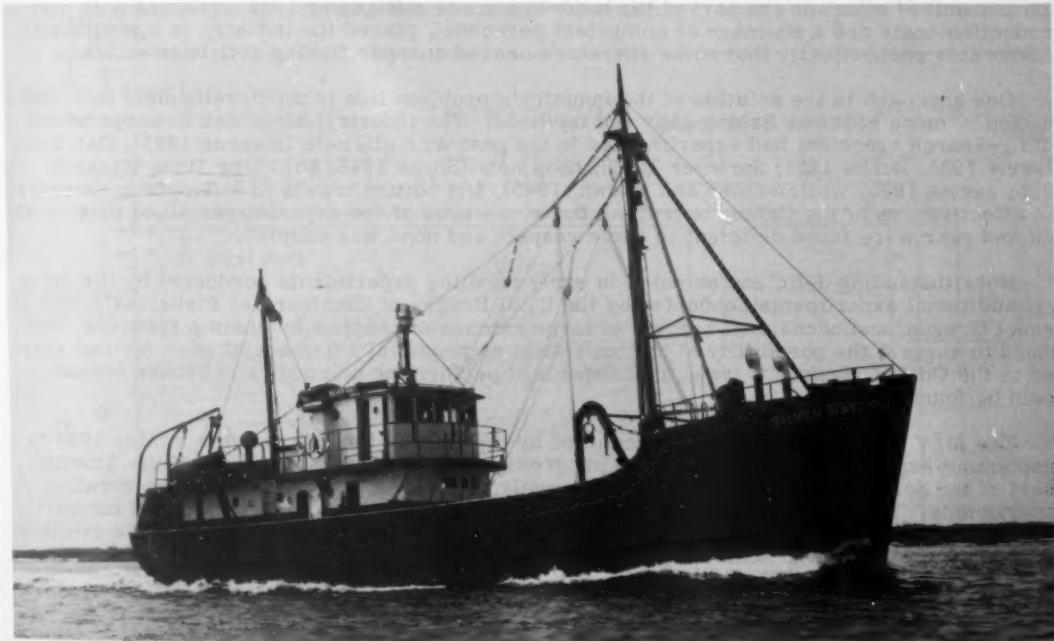


Fig. 1 - The M/V Silver Bay--96.4-foot North Atlantic dragger used in the snapper-trawl studies.

The U. S. Bureau of Commercial Fisheries chartered vessel Silver Bay, a 96.4-foot North Atlantic dragger, was used, therefore, to carry out a study designed primarily to develop otter-trawling gear and methods and to introduce these to the snapper fishery. The study was conducted intermittently from June 1957 through May 1959.

*Fishery Methods and Equipment Specialists, Branch of Exploratory Fishing, Division of Industrial Research, U. S. Bureau of Commercial Fisheries, Pascagoula, Miss., and Brunswick, Ga.

Bottom-trawling gear, consisting of nylon netting, wooden rollers, and Vigneron-Dahl (V-D) rigging, was developed that successfully permitted trawling on rough and broken bottom and that could be used with vessels now existing in the Gulf of Mexico.

Commercial quantities of marketable snapper and grouper were taken with the gear developed. Two simulated-commercial cruises to the Campeche Banks area yielded catches totaling 44,504 pounds of marketable snapper and grouper from depths of 20 to 50 fathoms. Daily catches ran as high as 2,400 pounds and the maximum single drag yielded 1,775 pounds. On several occasions, trawl catches exceeded the catches of hand-line vessels working the same area.

Use of electronic devices (loran, radar, and especially depth-recorders) proved to be of great practical value.

Results suggest that the otter trawl can be a profitable commercial gear for snapper and grouper in the Gulf of Mexico fishery.

BACKGROUND

The commercial fishery for red snapper and grouper of the Gulf of Mexico has been carried out almost exclusively with hand lines for the past century. The hand-line method has proved unprofitable in many cases despite the willingness of the industry to adopt new accessory equipment, including mechanical reels (Siebenaler and Brady 1952), depth recorders, and electronic navigational aids (Rathjen 1958). Recently, a substantial decrease in production per unit of effort on the part of the hand-line vessels (Camber 1955), coupled with high production costs and a shortage of competent personnel, placed the industry in a position so unfavorable economically that some operators ceased snapper fishing activities entirely.

One approach to the solution of the industry's problem lies in the development and introduction of more efficient fishing gear and methods. The industry, alone and in cooperation with research agencies, had experimented in the past with gill nets (Stearns 1885), fish traps (Jarvis 1935; Bullis 1951; Springer 1951), hoop nets (Smith 1948a&b), long lines (Stearns 1885; Jarvis 1935; Whiteleather and Brown, 1945), and bottom trawls in attempts to increase the effectiveness of the fishing operation; but at the time of the experiments all of those methods and gear were found deficient in some respect and none was adopted.

Notwithstanding deficiencies noted in early trawling experiments conducted by the industry, additional experiments conducted by the U. S. Bureau of Commercial Fisheries research vessel Oregon, and occasional reports of large catches of snapper by shrimp trawlers, continued to suggest the possibility of bottom trawls as practical commercial gear for red snapper in the Gulf of Mexico, if trawl gear capable of performing on rough and broken bottom could be found.

The M/V Silver Bay, which was acquired by the Bureau through charter in May 1957 to supplement exploratory work already in progress in the Gulf of Mexico and off the Atlantic coast of the Southeastern States, was used largely, therefore, to conduct snapper-trawling experiments. The objective of the experiments was the design and development of bottom-trawling gear suitable for use in the commercial snapper fishery by fishing vessels available in the Gulf of Mexico.

VESSEL AND EQUIPMENT

The M/V Silver Bay, a conventional North Atlantic dragger of welded-steel construction, was built in 1946. The vessel has an over-all length of 96.4 feet, a beam of 22.6 feet, and a draft of 12 feet. Insulated hold space is available for approximately 200,000 pounds of iced fish. Accommodations are provided for 17 men. The main propulsion plant develops 562 brake-horsepower at 350 r.p.m., providing a cruising speed of nine knots, and fuel and water capacity are sufficient for 20 days of continuous operation. A heavy-duty double-drum trawling winch is driven by the main engine through a front power take-off and chain-and-sprocket drive. Capacity of each winch drum is approximately 650 fathoms of $\frac{1}{16}$ -inch-diameter cable.

Vessel design and deck arrangement permit trawling from either the port or the starboard side. This arrangement, and the identical gear carried on each side, kept lost fishing time to a minimum for, when gear damage occurred on one side, the gear on the other side was ready to be used immediately.

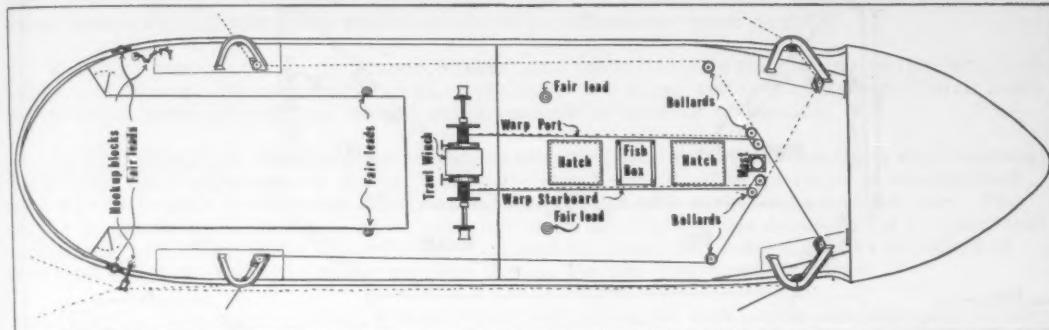


Fig. 2 - Deck plan of M/V Silver Bay--the bollard-fairlead arrangement allows trawling from either the port or the starboard side of the vessel.

Electronic equipment aboard the Silver Bay included: Two loran receivers, radar, deep-water depth-recorder (0- to 2,200-fathom range), "white-line" depth-recorder (0- to 480-fathom range), shallow-water depth-recorder (0- to 450-fathom range), and a magnetic-compass automatic pilot.

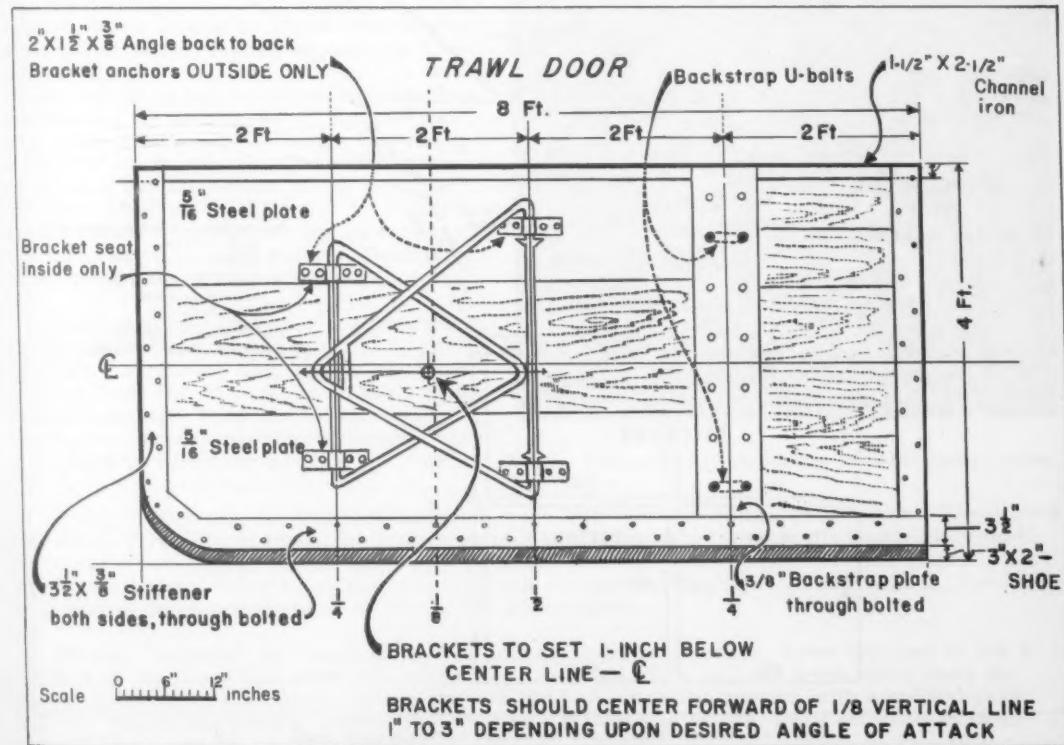


Fig. 3 - Bracket doors, 4 by 8 feet and reinforced with steel plate, were used to spread the snapper trawling gear.

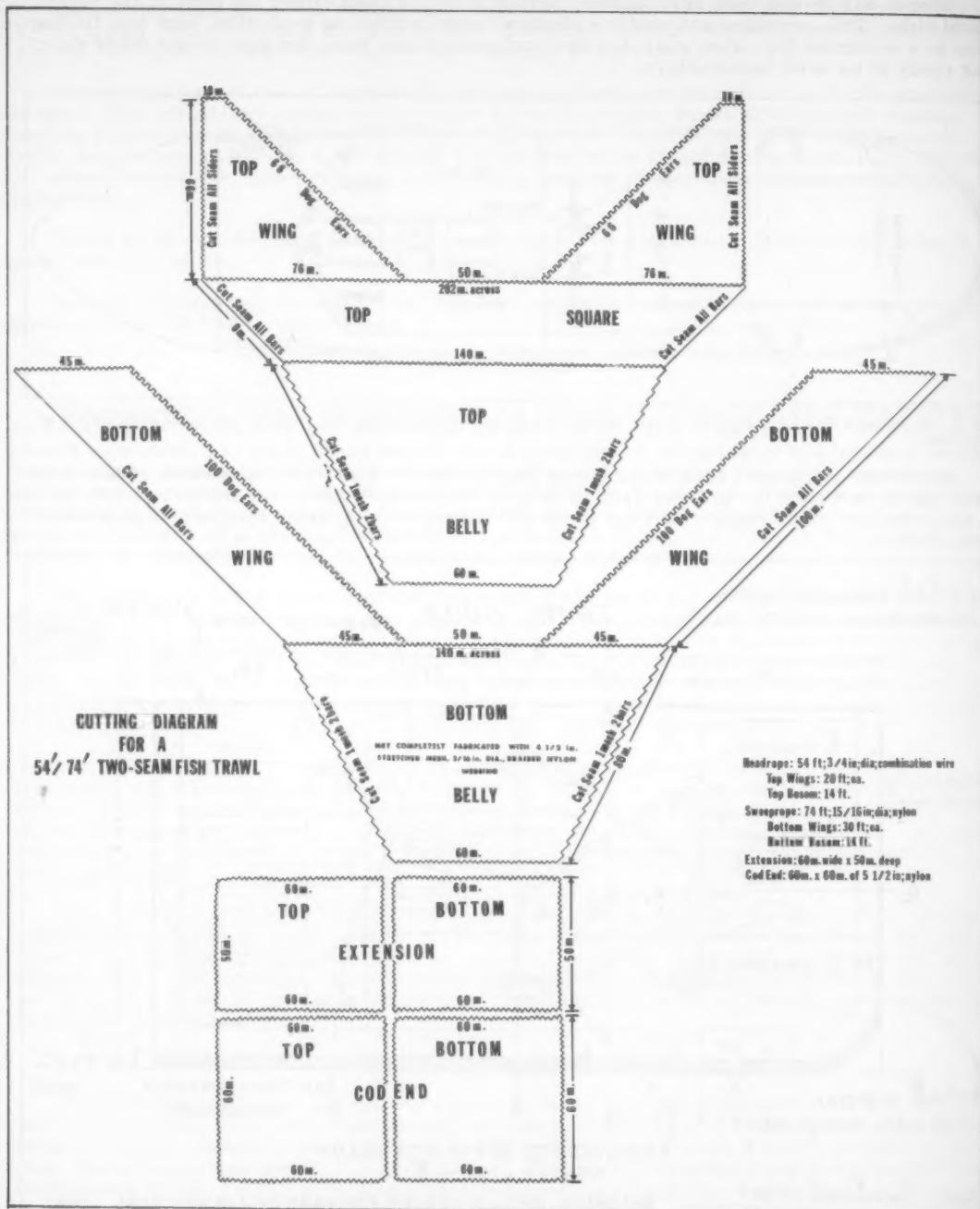


Fig. 4 - Construction diagram of the 54-foot-74-foot snapper trawl.

GEAR AND METHODS

Conventional North Atlantic gear, constructed from manila and cotton twine, was used at the beginning of the trawl studies. This gear was fished with bracket doors and Vignerons-Dahl (V-D) rigging and has been described in detail by Knake (1956). Results obtained were not satisfactory, but served to point out where modifications were needed.

Modified gear was then developed, tested, and found suitable for fishing rough- and broken-bottom areas. Its reasonable cost, simplicity of design, and relatively small size make the modified gear suitable for many fishing vessels in the Gulf of Mexico.

OTTER BOARDS: Rectangular boards measuring 4 by 8 feet and weighing approximately 900 pounds each were used to spread the trawl (figs. 3 and 6). The doors were constructed from $2\frac{1}{2}$ - by 8-inch lumber and were heavily reinforced with steel angle and flat bar. The brackets, constructed from $1\frac{1}{4}$ -inch round bar were attached to the doors in the conventional manner (fig. 4). The doors proved rugged enough to resist the sudden shocks received in hang-ups and required only minor repairs during the two-year period of use.

TRAWL: The high-opening, 2-seam fish trawl, hung 54 feet on the headrope and 74 feet on the footrope (fig. 4), was constructed from $5\frac{1}{2}$ -inch-mesh braided nylon twine. Braided-nylon twine with a tensile strength of approximately 400 pounds was preferred to other types of nylon twine because its superior knot strength enabled the meshes to hold their shape even when the twine was subjected to great stress. The increased strength of the braided twine--2 to 4 times that of cotton twine of equivalent weight--enabled the gear to be fished on rough bottom with minimum gear loss or damage.

Wooden rollers, 20 to 24 inches in diameter, were strung on $\frac{5}{8}$ -inch-diameter steel roller wire. Roller separation was accomplished with 6-inch wooden spacers used in pairs on the bottom bosom section (separating the rollers by 12 inches) and in groups of three on the wings (providing a spacing of 18 inches). The rollers were used along the full length of the footrope and were attached to the trawl by 20-inch roller chains stopped onto the footrope--one chain at each large roller. Details of attachment are shown in figure 5.

The trawl was "hung in" 20 percent on the top and bottom wings (i.e., 20 percent more stretched netting was used than hanging line) and 37 percent on the top and bottom bosoms. This modification in hanging materially reduced a common type of damage in which the hanging selvage is torn from the hanging line.

Forty 7-inch standard spherical floats were first used to raise the headline. These gave satisfactory results at dragging speeds up to 3 knots, but were apparently completely ineffective at 4 to 5 knots. Substitution of a patented "rising-panel device" for the floats in the bosom section provided a solution to problems encountered in high-speed trawling, and catches at higher speeds increased following the substitution.

Manila "helpers" or "belly lines," $2\frac{1}{4}$ inches in circumference, were attached to the 4 corners of the trawl and sewn full length to the cod end. The helpers were sewn down the square mesh from the corner rather than on the bar, as is the custom with standard gear (fig. 6). Additional pieces, approximately 3 to 4 fathoms in length, were attached at intervals along the bottom wings and belly.

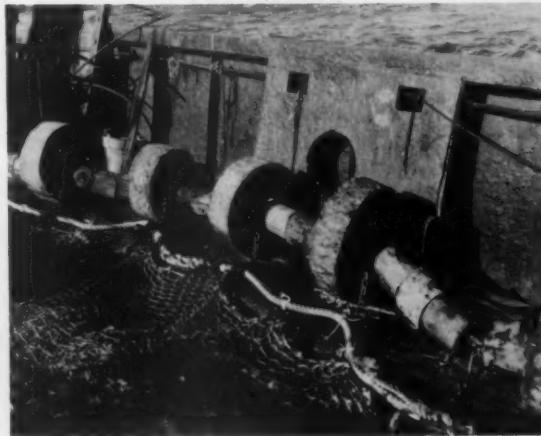


Fig. 5 - Bosom section of trawl showing method of attaching rollers to footrope.

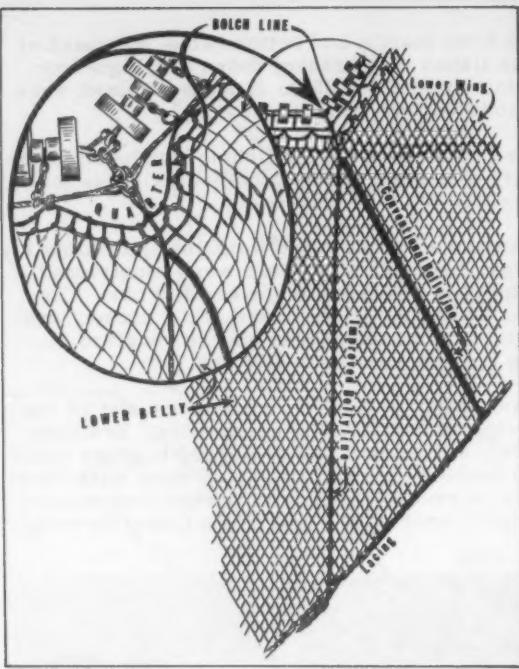


Fig. 6 - Detail of trawl quarter showing attachment of modified "helper" or "belly line."

The headrope was $\frac{3}{4}$ -inch-diameter manila-clad wire rope. Doubled $\frac{3}{16}$ -inch-diameter braided nylon twine was used to hang the webbing to the headrope and bolch line. Approximately 3 inches of slack was allowed in hanging. The bolch or hanging line (fig. 6) was approximately 20 percent longer than the nylon footrope and was stopped onto the latter in bights with single braided nylon twine. To prevent chafing by coral and rock, a heavy bull hide was attached full length to the bottom of the cod end.

FISHING METHODS: The roller gear, and associated Vigneron-Dahl rig, was handled by the side-trawl method described by Knake (1958). Although not mandatory, this method greatly facilitates handling heavy gear with minimum manpower (figs. 7 and 8).

The trawl was normally fished with two 10-fathom legs that were connected directly



Fig. 7 - "Shooting" the trawl in the side trawling operation.

to the boards through a kelly-eye and stopper arrangement. In general it was found that the greater the distance between boards and trawl, the greater the catch; but the number of hang-ups increased proportionately with the length of the ground cables on bad bottom. A total of 15 fathoms of ground cable was added between legs and doors when bottom conditions were suitable. A 3:1 ration of towing-wire length to water depth was used normally, but on extremely rough bottom the ratio was reduced to 2:1.



Fig. 8 - Bosom rollers being brought on deck with the "gilson" (whip). Wing rollers remain overboard.

FISHING RESULTS

Operations during the first year (June 1957-May 1958) were concerned primarily with gear design and modification and were confined to the known bad-bottom red snapper grounds of the north and northwestern Gulf of Mexico. Trawl catches in those areas were generally small, but were of sufficient magnitude to permit tentative evaluation of the effective-

ness of the gear. Results during this period have been reviewed by Rathjen (1958).

Trawling operations were extended to Campeche Bank in the spring of 1958 so that the trawl gear could be tested in areas being fished by hand-line vessels. A total of 5 cruises were completed on the Bank from May 1958 to May 1959. At least limited exploratory coverage was extended to all the areas of the Bank of known productivity. Good catches were confined to the areas south and west of Cayos Arcas. Two simulated commercial production cruises (Nos. 12 and 16) completed in those areas resulted in a total catch of 44,504 pounds of marketable snapper and grouper. Catch data by depth and season are summarized in table 1, and results of cruises 12 and 16 are summarized in table 2.

Daylight trawl catches on Campeche Bank ranged as high as 2,400 pounds of snapper and grouper per day. The best individual drag resulted in 1,775 pounds of fish in 90 minutes of fishing time. Nighttime trawling consistently yielded much smaller catches.



Fig. 9 - Large red snapper and jewfish taken in a trawl drag south of Cayos Arcas by the M/V Silver Bay.

Table 1 - Snapper and Grouper Catch by Season and Depth, M/V <u>Silver Bay</u> Cruises 8, 12, 14, 15, and 16, Campeche Area						
Season and Depth	No. Trawl Drags	Trawl Catch		Average Catch Per Drag		
		Snapper	Grouper	Total	Snapper	Grouper
Spring:						
0-10	0	0	0	0	0.00	0.00
11-20	1	9	0	9	9.00	0.00
21-30	122	13,329	3,209	16,538	109.25	26.30
31-40	41	9,918	800	10,718	241.85	19.51
41-50	13	1,488	168	1,656	114.46	12.32
51-60	3	7	20	27	2.33	6.66
61+	5	0	0	0	0.00	0.00
Totals	185	24,749	4,197	28,946	-	-
Averages	-	-	-	-	153.77	22.58
Fall:						
0-10	0	0	0	0	0.00	0.00
11-20	0	0	0	0	0.00	0.00
21-30	74	22,320	1,109	23,439	301.15	14.98
31-40	2	753	41	794	377.50	20.50
41-50	0	0	0	0	0.00	0.00
51-60	0	0	0	0	0.00	0.00
61+	0	0	0	0	0.00	0.00
Totals	76	23,083	1,150	24,233	-	-
Averages	-	-	-	-	303.72	15.13
Winter:						
0-10	0	0	0	0	0.00	0.00
11-20	0	0	0	0	0.00	0.00
21-30	59	9,583	1,209	10,792	162.42	20.49
31-40	18	2,568	95	2,663	142.66	5.27
41-50	5	430	0	430	86.00	0.00
51-60	1	150	0	150	150.00	0.00
61+	0	0	0	0	0.00	0.00
Totals	83	12,731	1,304	14,035	-	-
Averages	-	-	-	-	153.38	15.71
All-Season Totals	344	60,563	6,851	67,214	-	-
All-Season Averages	-	-	-	-	176.05	19.33
						318.85

A total of 11 species of snapper were represented in trawl catches (table 2), of which 3 species (red snapper, mutton snapper, and lane snapper) were taken in commercial quantities. Red snapper accounted for the largest part of the total catch, and that species was taken in all areas of operation--most commonly between 20 and 50 fathoms. Most of the snapper taken in water shallower than 30 fathoms weighed more than 1 pound, although smaller snapper were more abundant in deeper water. Lane snapper and mutton snapper were taken in quantities on Campeche Bank between 20 and 30 fathoms, but were absent from catches in other areas.

A total of 9 species of grouper were represented in the trawl catches. The species occurring commonly are listed in table 2. Red grouper, black grouper, and scamp accounted for the bulk of the grouper catch in all areas fished. On Campeche Bank, grouper catches made up as much as 10 percent of the total catch, but in other areas the percentage due to grouper was smaller. Grouper were present at all depths fished.

On several occasions, daily trawl catches greatly exceeded the hand-line catches of individual vessels fishing the same area. This

Table 2 - Catch Data—Simulated Commercial Trawling Operations of M/V Silver Bay Cruises 12 & 16, Campeche Bank

Species Scientific Name	Common Name	Catch			
		Cruise 12, November-December		Cruise 16, April-May	
		Total Weight	Average Weight	Total Weight	Average Weight
(Pounds)					
<i>Lutjanus syringa</i>	Red snapper	1/11,449	5	14,271	8
<i>Lutjanus synagris</i>	Lane or rainbow snapper	1/3,308	1 $\frac{1}{2}$	624	1 $\frac{1}{2}$
<i>Lutjanus analis</i>	Mutton or king snapper	6,115	10	3,760	10
<i>Lutjanus griseus</i>	Grey snapper	222	8	175	20
<i>Lutjanus apodus</i>	Schoolmaster snapper	683	6	251	5
<i>Ocyurus chrysurus</i>	Yellowtail snapper	334	2	-	-
<i>Rhomboplites auroraberco</i>	Vermilion snapper	1/900	1 $\frac{1}{2}$	-	-
<i>Lachnolaimus maximus</i>	Hog snapper	72	8	74	5
<i>Epinephelus morio</i>	Red grouper	446	8	427	10
<i>Myctoperca</i> (2 sp.)	Scamp	312	4	628	8
<i>Myctoperca bonaci</i>	Black grouper	392	12	948	15
<i>Lutjanus vivanus</i>	Yelloweye or silk snapper	-	-	11	4
<i>Garopus porosus</i>	Warsaw grouper	-	-	20	10
<i>Epinephelus</i> (2 sp.)	Rock hind	-	-	22	3
<i>Promicrops itala</i>	Jewfish	-	-	260	130
Totals		24,233	-	21,471	-

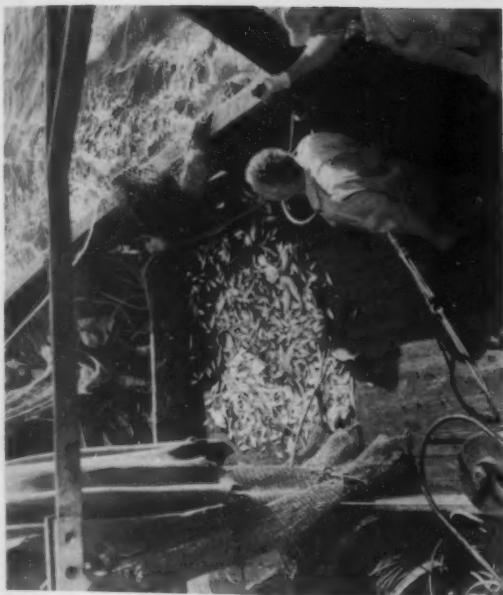
1/Indicates approximately 1,200 lbs. of unmarketable snapper taken when a 2-inch mesh liner was used for sampling purposes.

occurred most often when rough seas prevailed, but at other times trawl catches were larger owing, perhaps, to the fish not being attracted to the hand-line bait.

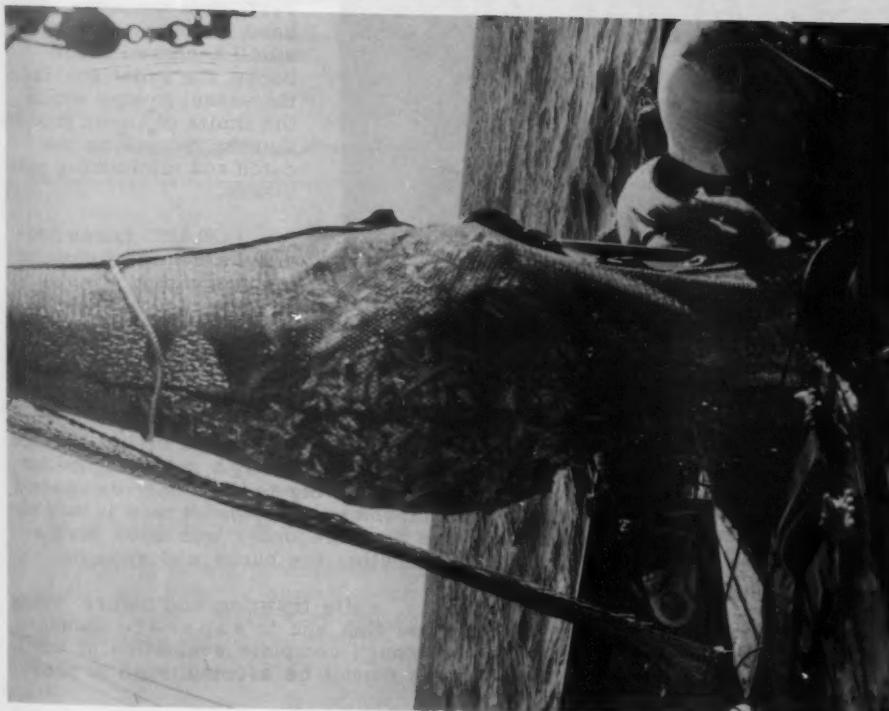


Fig. 10 - A 1,000-pound snapper catch dressed and ready for stowage aboard the M/V Silver Bay.

(B)



(C)



(A)

Fig. 11 - Escapement tests: (A) Releasing cod-end cover. The small fish which have sifted through the large mesh cod end can be seen just inside the cover. (B) Small fish which escaped through the cod-end mesh, but were retained by the 2-inch mesh cover. (C) Large fish retained by the 5 $\frac{1}{2}$ -inch mesh of the cod end.

A number of experiments were conducted to determine the escapement rate of undersize snappers through the $5\frac{1}{2}$ -inch-mesh cod end. These experiments, which consisted of intermittent use of 2-inch cod-end covers, indicated that approximately 95 percent of all snapper under one pound in round weight successfully escaped through the $5\frac{1}{2}$ -inch mesh of the cod end (fig. 11).



Fig. 12 - Weighing the catch aboard the M/V Silver Bay prior to icing the fish.

Each of the three depth-recorders carried aboard the vessel served a specific function. In combination, or singly, they were used to provide constant assessment of the sea bed and fish concentrations. The shallow-water depth-recorder, although not designed for fish finding, was used to delineate bottom conditions owing to the finely detailed bottom tracings that could be obtained with this machine (fig. 13). It was in use almost continuously while trawling. The deep-water depth-recorder was used more extensively for navigational purposes and for locating the banks and grounds.

The "white-line" recorder was used extensively, while trawling and before, owing to its ability to portray concentrations of demersal fish and to separate those concentrations from the sea bottom (fig. 14). Although complete evaluation of the effectiveness of this recorder in detecting fish schools cannot be accomplished at pres-

USE OF ELECTRONIC FISHING AND NAVIGATIONAL AIDS

The electronic equipment carried by the M/V Silver Bay has been listed previously. Use of this equipment greatly facilitated snapper fishing operations.

RADAR: Radar was especially valuable when the vessel was fishing small grounds at night or during other periods of restricted visibility. When used in conjunction with small anchored radar buoys, the radar enabled the vessel to stay within the limits of known grounds, thereby increasing the catch and minimizing gear losses.

LORAN: Loran provided a means of pinpointing productive grounds and provided a means of easily relocating areas of high potential.

DEPTH RECORDERS:

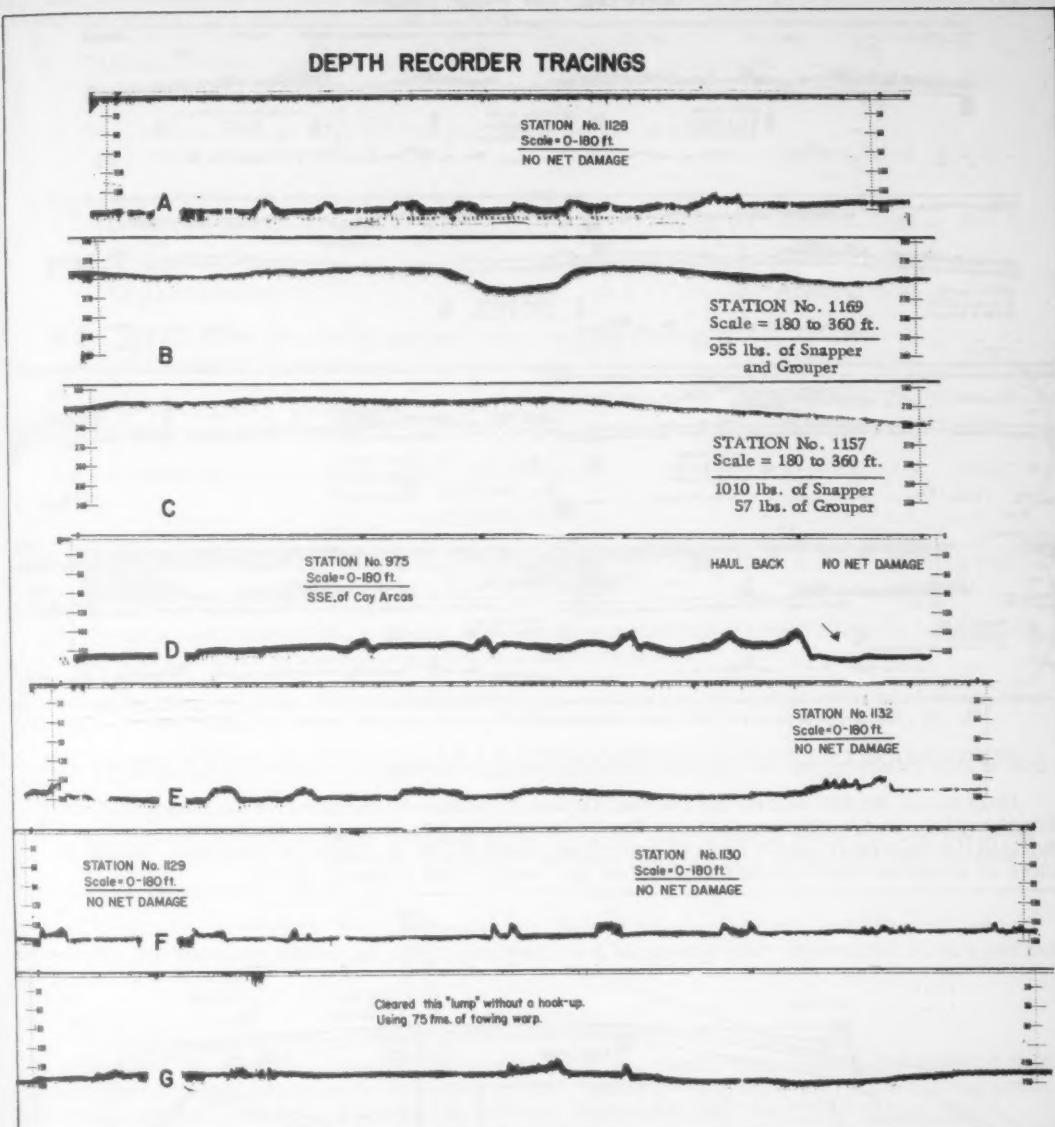


Fig. 13 - Depth-recorder tracings of sea bed on the red snapper grounds south and west of Cayos Arcas. The shallow-water recorder was not designed for, and did not pick up, fish concentrations.

ent--owing to the passage of small species of fish and squid through the $5\frac{1}{2}$ -inch meshes of the cod end--on several occasions some correlation between catch and echo-tracings was possible. More experience with the machine is necessary before interpretations of the tracings can be completed.

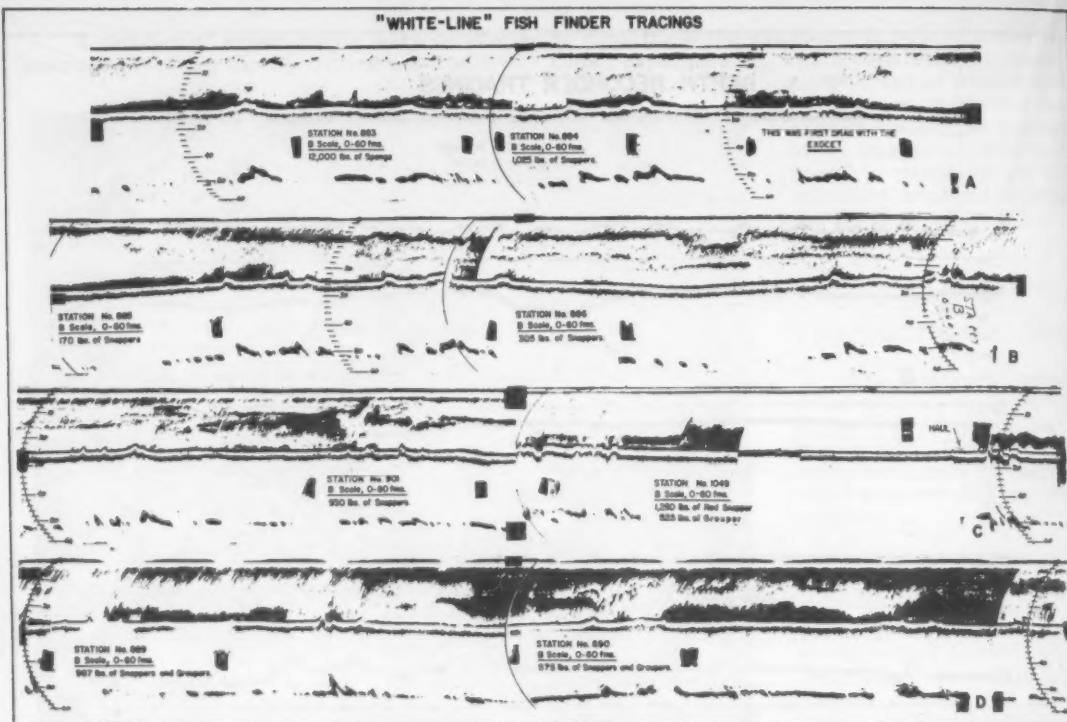


Fig. 14 - Recordings of demersal fish concentrations south of Cayos Arcas on the "white-line" depth-recorder.

CONVERSION OF GULF OF MEXICO SHRIMP TRAWLERS TO SNAPPER TRAWLING

Only minor modifications and the installation of relatively inexpensive deck equipment are necessary to convert existing shrimp vessels to snapper-trawling gear and techniques (fig. 15). Owing to the relatively small cost of conversion, vessels can be rigged for snapper fishing in times of small shrimp catches as well as for year-round snapper fishing.

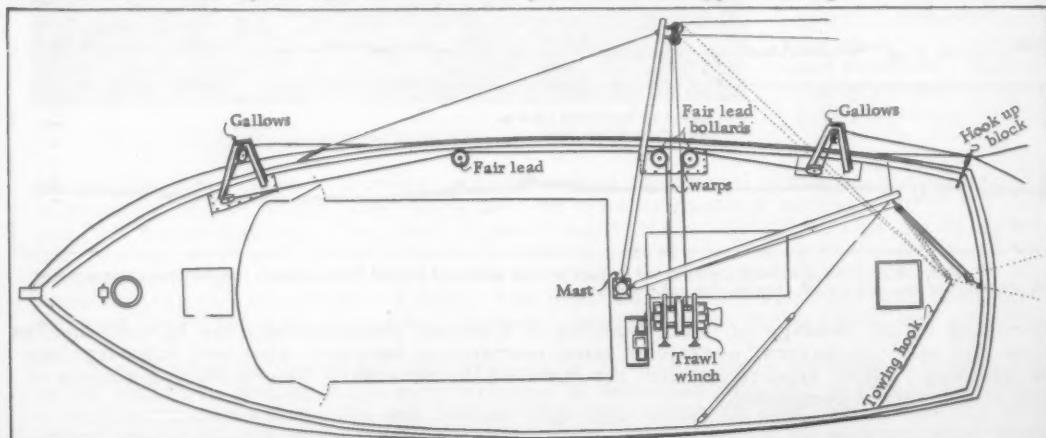


Fig. 15 - Deck plan of typical shrimp vessel, showing proposed location of gallows frames and fairlead blocks for side-trawl operations.

The modifications and approximate costs of conversion, at 1959 price levels, for a typical shrimp vessel are summarized as follows:

1. Gallows frames, bollards (deck blocks), and other permanent deck fittings; including installation	Approx. cost \$1,500
2. Double-drum trawl winch ^{1/} --capacity 150 to 200 fathoms of $\frac{5}{8}$ -inch-diameter cable	Approx. cost 2,500
3. Heavy-duty bracket doors ($6\frac{1}{2}$ feet by 44 inches, weight 500 to 600 pounds each), per pair	Approx. cost 300
4. Braided nylon trawl ($\frac{54}{74}$ foot) rollers, floats, cod end, and accessories	Approx. cost 900
5. Vigneron-Dahl gear, legs, ground cable, towing chains, and accessories	Approx. cost 200
6. Accessory gear--quarter ropes, lazylines, messenger, and shackles	Approx. cost 150
7. Towing warp $\frac{5}{8}$ -inch-diameter ^{2/} , 300 fathoms	Approx. cost 500

CONCLUSIONS

1. Modified otter trawls can be used as effective commercial means of catching red snapper, grouper, and other species in the Gulf of Mexico.
2. Broken and rough bottom areas, previously considered untrawlable, can be worked economically with gear properly designed and constructed.
3. Additional species of marketable snapper, not generally caught with hand lines, are available to trawl gear.
4. Release of undersize snapper is accomplished effectively by large-mesh trawls and cod ends.
5. Daily trawl catches often surpass those of hand-line vessels when the two methods are used simultaneously in one area--especially when the fish are apparently not feeding or during periods of heavy seas.
6. Trawl gear, suitable for use by present Gulf of Mexico shrimp vessels, can be adopted by the industry either on a full scale or as a supplementary operation during periods of low shrimp catches.

APPENDIX

A detailed fishing log, showing geographic position, depth, date, catch, and related data for each drag, is available as an appendix to the reprint of this article. Write for Separate 600, which shows "Table 3 - Fishing Log--Trawl Stations--1957-59--M/V Silver Bay."

LITERATURE CITED

- | | |
|---|---|
| BULLIS, HARVEY R., Jr.
1951. The Gear Development Program of the M/V <u>Oregon</u> .
Proceedings of the Gulf and Caribbean Fisheries Institute, Fourth Annual Session, 1951, pp. 101-103. | Banks, Florida State Board of Conservation, Tech. Ser. No. 12, pp. 1-63. |
| CAMBER, C. ISAAC
1955. A Survey of the Red Snapper Fishery of the Gulf of Mexico with Special Reference to the Campeche | JARVIS, N. D.
1935. Fishery for Red Snappers and Groupers in the Gulf of Mexico. U. S. Fish and Wildlife Service, Investigational Report No. 26, pp. 1-29. |
| ^{1/} Most large shrimp vessels are equipped with a suitable winch. | |
| ^{2/} Half-inch-diameter wire may be used on vessels of under 40 gross tons. | |

KNAKE, BORIS O.

1956. Assembly Methods for Otter-Trawl Nets. U. S. Fish and Wildlife Service, Fishery Leaflet No. 437, 29 pp.
1958. Operation of North Atlantic Type Otter Trawl Gear. U. S. Fish and Wildlife Service, Fishery Leaflet No. 445, 16 pp.

RATHJEN, WARREN F.

1959. Experimental Trawling for Red Snapper. Proceedings of the Gulf and Caribbean Fisheries Institute, 11th Annual Session, 1958, pp. 128-132.

SMITH, R. O.

- 1948a. Experimental Fishing for Red Snapper. Part I. The Use of Hoop Nets. Commercial Fisheries Review, vol. 10, no. 2, pp. 1-10. (Also Separate No. 195.)
- 1948b. Experimental Fishing for Red Snapper. Part II. The Use of Mechanical Reels. Commercial Fisheries Review, vol. 10, no. 3, pp. 6-7. (Also Separate No. 198.)

SPRINGER, STEWART

1951. The Oregon's Fishing Exploration in the Gulf of Mexico 1950. Commercial Fisheries Review, vol. 13, no. 4, pp. 1-8. (Also Separate No. 277.)

and BULLIS, H. R. Jr.

1952. Exploratory Shrimp Fishing in the Gulf of Mexico, 1950-51. U. S. Fish and Wildlife Service, Fishery Leaflet No. 406.

1954. Exploratory Shrimp Fishing in the Gulf of Mexico, Summary Report for 1952-54. Commercial Fisheries Review, vol. 16, no. 10, pp. 1-16. (Also Separate No. 380.)

SIEBENALER, J. B. and BRADY, W.

1952. A High Speed Manual Commercial Fishing Reel. Florida State Board of Conservation, Technical Series No. 4, pp. 1-11.

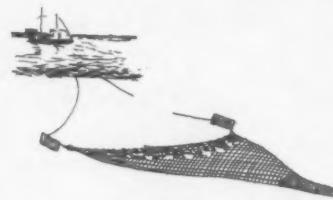
STEARN'S, SILAS

- 1885a. The Fisheries of Pensacola, Florida. Bulletin U. S. Fish Commission, vol. 5, pp. 245-247.

- 1885b. Notes on Red Snappers. Bulletin U. S. Fish Commission, vol. 5, pp. 92-95.

WHITELEATHER, R. T. and BROWN, H. H.

1945. An Experimental Fishery Survey in Trinidad and Tobago and British Guiana. Anglo-American Caribbean Commission. U. S. Government Printing Office, Washington, D. C., 130 pp.



KELP AND HERRING SPAWN

Two commercial operators at Craig, Alaska, harvested 46 tons of kelp and herring eggs this spring. The procedure is to place kelp on herring spawning grounds to collect a layer of herring eggs on the kelp. A light covering of eggs on the kelp is sought; however, this spring approximately two-thirds of the total weight of the harvested product consisted of herring eggs.

The product is packed in barrels and shipped to the oriental market on the West Coast. The oriental trade there considers it a delicacy. U. S. Bureau of Commercial Fisheries biologists claim the number of eggs removed in this operation will have no measurable effect on herring production.

STRUCTURE OF THE FISHING INDUSTRY IN THE EUROPEAN COMMON MARKET

By P. Hovart*

BACKGROUND

Since the end of World War II, an effort has been made to integrate the western European economies at an accelerated rate. Several plans have been worked out for that purpose--some remain theoretical speculation, but others have been put into practice.

By the Treaty of Rome six western European nations--Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany--agreed to establish a European Common Market on January 1, 1958. The first important agreements of the Treaty¹, namely, the reduction of import duties and the extension of quota restrictions became effective on January 1, 1959.



Fig. 1 - A modern Belgium distant-water trawler operating out of Ostend.

The Common Market plans the gradual removal of international tariffs and quotas and the development of a single tariff system between the Six, or Common Market Countries, and the rest of the world²!

The Treaty also provides for the free movement of persons, services, and capital; for common policies with respect to agriculture (and fishing industry), transport, and competition; and for coordination of national policies on many aspects of economic development.

A number of common institutions have been set up in order to implement the principles and the general provisions of the Treaty.

The establishment of the European Common Market is tied to a timetable. This means that at certain stages measures will be taken, so that after a transition period of 12 to 15 years the Common Market will become a complete reality.

The consequences of the Common Market for western European trade and industry are not fully foreseeable as yet. This also applies to the fishing industry of Western Europe.

The evolution of fisheries in the Common Market, however, can be visualized by examining its structural elements, such as catching capacity, production, consumption and foreign trade³.

*Secretary of the Professional Fisheries Council, Ostend, Belgium.

¹/Articles 14 and 33.

²/Article 3.

³/For this study the author has drawn certain data from "Introductory Report about the Fishing Industry in the European Common Market." The author wrote the report for the Professional Fisheries Council in Belgium. The statistical data, however, were revised and regrouped.

The fishing capacity in the Common Market Countries^{4/} can be determined to a limited extent by examining their statistics on fishing fleets and the number of fishermen.

FISHING FLEET

Generally speaking, the Common Market Countries exploit the same fishing grounds. The North Sea is the main source of supply, but more distant fishing grounds are also exploited.

But the fishing fleets of the Common Market Countries vary widely, and not all craft or all categories of vessels are of the same importance.



Fig. 2 - The fish auction, IJmuiden, Netherlands.

The Belgian fishing fleet consists of motor vessels (440 with 67,243 hp. and 25,446 gross registered tons) and steam vessels (6 with 6,420 hp. and 3,783 GRT). According to the engine power, which limits also the field of operation, the fleet is divided into seven categories^{5/}: from cutters (15 hp. and 5 GRT each) to deep-sea trawlers (1,450 hp. and 768 GRT each). On January 1, 1958, the Belgian fleet numbered 446 units--29,229 gross registered tons and 73,663 hp.^{6/}

During the past few years, the Belgian fishing fleet has increased in number, tonnage, and horsepower. It is striking, however, that the number of vessels of the smaller types has ^{4/}As Luxemburg has no fishing industry, it has been left out of the study, except for its foreign trade which is included with Belgium since a Belgium-Luxemburg Customs Union has existed for many years. ^{5/}Namely, cutters (less than 80 hp.), coastal motor trawlers (80-119 hp.), medium trawlers (120-239 hp.), deep-sea motor trawlers (240-349 hp.), deep-sea medium motor trawlers (350-499 hp.), deep-sea large motor trawlers (over 500 hp.), and large deep-sea steam trawlers (over 439 hp.). ^{6/}Source: Bestuur van het Zeewesen.

decreased. The increase in the number of units, tonnage, and horsepower is the result of adding larger and more powerful vessels to the fleet. Since World War II no new small vessels have been built, and this explains the unfavorable average age (24 years) of the smaller vessels.

In France, the fishing fleet consists of steam, motor, and sailing vessels. At the beginning of 1958 the French fleet consisted of 15,912 units with 250,011 gross registered tons^{7/}--28 steam trawlers with 11,471 GRT, 13,500 motor trawlers with 234,831 GRT, and 2,384 sailing vessels with 3,709 GRT.

Since the last war the number of steam trawlers and sailing boats has greatly decreased in France. The motor trawlers, on the other hand, have increased in tonnage as well as in horsepower. Recently the building of larger vessels has been strongly stimulated in France.



Fig. 3 - Unloading and boxing of fish at Boulogne, France.

In Italy there were 43,948 vessels as of January 1, 1958, with a tonnage of 147,913 gross registered tons--11,126 motor vessels and small motor boats (total 102,032 GRT) and 32,822 sailing boats (total 45,881 GRT)^{8/}. The number of sailing vessels are decreasing, but motor vessels have been partly modernized during the last few years.

The Netherlands fishing fleet includes a great variety of vessels, the classification of which varies from row boats to sailing vessels to motor trawlers of 800 hp. On January 1, 1958, the fishing fleet consisted of 669 vessels registered for sea fisheries with a total tonnage of 66,867 gross registered tons^{9/}. Included are steam trawlers, steam luggers, motor

^{7/}Includes Algeria--the number of vessels in Algeria totaled 1,123 units of which 1,068 were motor vessels and 65 sailing vessels.

Sources: Ministere de la Marine Marchande.

^{8/}Sources: "Il Giornale della Pesca" (September 5, 1958).

^{9/}Sources: Directie van de Visserijen.

trawlers, motor luggers, and motor cutters. A number of the vessels--mostly the smaller ones--are also registered for inshore fisheries and fisheries in Lake Ijssel. Also, there are motor boats, sailing boats, and row boats which almost exclusively operate in the inshore fisheries.



Fig. 4 - German distant-water trawler tied up at dock, Hamburg. Note overhead ice conveyor for icing-up vessels.

Since 1950, the number of steam vessels has decreased. On the other hand, motor trawlers and motor luggers increased. The motor cutters also grew in numbers and fishing capacity.

In West Germany the fishing fleet consists of trawlers, luggers, cutters, and open boats without motors. At the beginning of 1958, the German fishing fleet numbered 3,429 units, of



Fig. 5 - Lugger-type trawler, engaged principally in fishing for North Sea herring docked at Hamburg.

which 29 were motor trawlers with a total of 18,209 gross registered tons, 177 steam trawlers (total 94,303 GRT), 104 luggers (total 24,063 GRT), 1,443 cutters, and 1,676 open boats without motors¹⁰.

After World War II the German trawler fleet had to be almost completely rebuilt. At first it was prohibited to build vessels of more than 400 gross registered tons. Later this restriction was removed and larger and more profitable vessels could be built (to about 800 GRT). At the same time the development was characterized by a conversion of coal-burning vessels into oil-burning vessels. Since 1950, steam luggers have disappeared. The motor luggers increased in number, but the new vessels generally had to replace the obsolete ones. In the cutter fleet, the vessels became larger and the engine power was increased.

CATCHING CAPACITY

Generally speaking, the catching capacity of the fishing fleet in the Common Market Countries is now greater than before the war and continues to increase. Larger and faster vessels are built, not only for distant-water fisheries, but also for near- and middle-water fisheries. At the same time, the vessels are equipped with modern navigational aids.



Fig. 6 - Fish auction at Cuxhaven, Germany

GOVERNMENT AID TO FISHING INDUSTRY

This development of the fishing fleets is largely a result of government policy to encourage the expansion of fishery production.

In Belgium a loan of up to 70 percent of the value of the vessel (or the motor) can, in principle, be obtained for the building or purchase of a fishing vessel (or a motor)¹¹. The Government allows a reduction in interest up to half of the normal rate of interest with a maximum of 3 percent, but demands a first mortgage on the vessel or motor. The loan is

¹⁰/Source: *Jahresbericht über die Deutsche Fischerei*, 1957, pp. 105-111.

¹¹/Law of August 23, 1948.

generally repayable in 12 or 10 years, respectively, for vessels and motors built or bought in Belgium or abroad.

Further, four Royal Warrants^{12/} grant certain financial concessions to vessel owners: (1) financial aid for improving fishing equipment, (2) a subsidy to encourage research on fishing methods, (3) a premium to encourage the collection of data concerning costs and earnings, and (4) a premium to vessel owners and boys for each day spent at sea.

In France, three plans have affected the fishing industry: the first is a program for reconstruction, and the second and third are plans for modernization and development which include aid from the Government.

First, the shipyards are granted subsidies for the construction of vessels of more than 50 gross registered tons^{13/}; and second, a reduction in interest is granted to vessel owners obtaining a loan for the construction in France of a vessel of more than 20 gross registered tons, which reduces the rate of interest to 4.5 percent^{14/}. Finally, the Government made available additional funds to the "Credit Maritime Mutual," so as to permit that organization to grant cheap loans to small fishing enterprises. The second and third plans for modernization and development include aid for processing and distribution as well as production.



Fig. 7 - Dock and wharf buildings at Hamburg-Altona fish harbor, Hamburg, Germany.

further provision applicable to the fishing industry is "facility credit," that is, credit with certain concessions as to interest rates and repayment^{18/}.

The Netherlands' Special Finance Program for the Fishing Industry^{19/} provides for financial aid on the basis of a fleet plan. Under this program the building of vessels can be financed by paying 25 percent in cash; obtaining another 25 percent on a mortgage; and supplying the balance of 50 percent as a loan from the Bank for Reconstruction. The latter loan is partially guaranteed by the Government.

In West Germany the Government grants loans for the building of fishing craft, allows a reduction in interest to 2 percent, grants subsidies for fuel, and subsidies for exploring new fishing grounds. From 1949 to 1951 the Government granted a coal subsidy and from 1951 to 1954 some reduction of taxes for firms and individuals who had interest-free loans for shipbuilding. Special aid is given deep-sea cutter and coastal fisheries.

^{12/}Royal Warrants of March 1, 1958.

^{13/}Law of May 24, 1951, and decree of November 25, 1951.

^{14/}Decree of March 18, 1954.

^{15/}Law of December 27, 1957.

^{16/}Law of July 29, 1957.

^{17/}This law dates from February 9, 1950, and took effect on February 24, 1950.

^{18/}This arrangement only applies to cases (rebuilding or repair) where credit is requested; it dates from August 9, 1954.

^{19/}The Program was in force on November 30, 1955, and is based on the report of the Commission for the Development of the Fishing Industry (Commission Tinbergen), which was submitted to the Government in May 1952.

NUMBER OF FISHERMEN

Because statistical data are lacking, the exact number of fishermen in the Common Market countries cannot be ascertained. Estimates indicate the following: Belgium about 1,800; France about 54,500; Italy about 123,000; Netherlands about 10,000; and West Germany about 117,000^{20/}.

In connection with the number of fishermen, it is interesting to mention the productivity per fisherman and per gross tonnage of vessel (table 1). No real significance, however, can be accorded these figures; they only indicate the general trend^{21/}.

West Germany ranks first for productivity per fisherman as well as for productivity per one gross tonnage of vessel. With regard to fisherman productivity, Belgium is second. For productivity per one gross tonnage of vessel, the Netherlands is second.

LANDINGS

In 1958, the total landings of fish and shellfish (including crustaceans and molluscs) of the Common Market Countries amounted to 1.6 million metric tons, landed weight. West

Germany was the main producing country with about 631,300 tons, or 39.1 percent of the total landings; followed by France (28.8 percent), the Netherlands (16.3 percent), Italy (12.2 percent), and Belgium (3.6 percent).

Table 2 compares the combined fishery landings of the Common Market Countries with those of the most important fishing countries of the world.

On the basis of the average landings for 1953-57, the combined landings of the Common Market Countries are sixth in importance as compared with the other leading fishing countries of the world.

CATCH TRENDS: During the five years of 1954-1958, the total fishery landings of the Common Market Countries decreased from 1,641,800 metric tons in 1954 to 1,614,800 tons in 1958, a decrease of 1.6 percent (table 3). The landings in that period reached the highest point in 1955 (1,733,100 tons).

The trend in fishery landings for each individual country is not the same as that for the six countries combined.

In Belgium the landings were highest in 1955, namely about 73,000 tons. After 1955 the landings dropped, but in 1958, they were slightly higher than in 1957. The French landings increased 7.6 percent from 1954 to 1956; after 1956 they remained at the same level. In Italy

^{20/}Sources: Data from the Ministry of Agriculture, Brussels.

^{21/}I refer to the calculations of Dr. G. Meseck in "Jahresbericht über die Deutsche Fischerei" 1957, p. 7.

Table 1 - Productivity Per Fisherman and Per One-Gross Tonnage of Vessel in Common Market Countries in 1958

Country	Amount of Fish (Landed Weight) Produced Per	
	Fisherman	One Gross Tonnage of Vessel
Belgium	32.0	2.0
France	8.5	1.9
Italy	1.6	1.3
Netherlands	26.4	3.0
West Germany	54.0	3.7

Table 2 - Landings in Most Important Fishing Countries of the World Compared with the Combined Landings for the Common Market Countries (Annual Average for 1953-57)^{1/}

Countries	Landings 1,000 Metric Tons
Japan	4,826
United States	2,716
China (Communist Mainland)	2,460
Russia	2,380
Norway	1,878
Common Market Countries	1,709
United Kingdom	1,070

^{1/}Yearbook of Fishery Statistics, 1958, vol. IX, Food and Agriculture Organization.

Table 3 - Fishery Landings in the Common Market Countries, 1954-58^{2/}

Countries	1958	1957	1956	1955	1954
Belgium	57.6	56.4	62.2	72.9	66.2
France ^{2/}	465.8	465.1	478.1	458.6	444.4
Italy	196.5	204.7	208.0	208.0	207.6
Netherlands	263.6	252.8	249.8	264.1	286.9
West Germany	631.3	663.8	669.7	729.4	637.2
Total	1,614.8	1,642.8	1,668.5	1,733.1	1,641.8

^{1/}Excluding fresh-water fish and salmon, trout, smelts, etc.

^{2/}Including Algeria.
Source: Yearbook of Fishery Statistics, 1958, vol. IX, Food and Agriculture Organization.

there were no important changes in landings from 1954 to 1956; in 1957 and especially in 1958, however, landings dropped off considerably. In the Netherlands the landings reached their lowest level in 1956; for 1957 and 1958 landings were higher, namely about 252,800 tons and 263,600 tons, respectively. In West Germany the peak year was 1955 (729,400 tons). After that year the German landings dropped off heavily--in 1958 the landings totaled about 631,000 tons, a decrease of 13.5 percent as compared to 1955.

COMPOSITION OF CATCH: In the Common Market, particularly roundfish and fresh herring are landed. Between 1954 and 1958, 43.7 percent and 19.5 percent of the total landings consisted of roundfish and fresh herring, respectively. The fact that roundfish and herring predominate in catches is in a way the crux of the productivity problem of the Common Market Countries. For, generally speaking, these species are, to say the least, not very popular with the consumer. Herring, moreover, is extremely seasonal in occurrence and much of the roundfish is caught far away from the main consumer centers²².

The composition of the catches in the member countries by species groups is shown in table 4.

Table 4 - Composition of Fishery Landings in Common Market Countries, Annual Average 1954-58

Country	Flatfish	Roundfish		Herring		Sprat ³	Mackerel	Sardines	Shrimp ⁴	Mussels	Other	Total
		Large ¹	Small ²	Salted	Fresh							
Belgium	12.0	26.8	4.1	—	10.2	1.3	0.4	—	2.3	—	6.0	63.1
France	13.2	128.5	114.4	0.3	48.9	2.0	34.9	33.5	3.1	5.8	77.8	462.4
Italy	0.5	6.4	80.3	—	—	—	—	68.0	0.6	2.9	46.3	205.0
Netherlands . .	19.8	24.3	5.9	77.7	44.3	2.0	13.6	—	5.0	57.3	13.6	263.5
W. Germany . .	8.7	173.8	161.7	45.7	219.8	4.8	7.8	—	5.5	7.3	31.2	666.3
Total	54.2	359.8	366.4	123.7	323.2	10.1	56.7	101.5	16.5	73.3	174.9	1,660.3

¹Cod, hake, haddock, etc.

²Miscellaneous marine teleosteans.

³/Including anchovy.

⁴/Food shrimp.

Source: FAO Yearbook of Fishery Statistics, 1958, vol. IX.

Of the Common Market Countries, the two most important producing countries of roundfish are West Germany and France. For the years 1954-58, Germany supplied 48.3 percent

of the large roundfish and 44.1 percent of the small roundfish landed in Common Market Countries. France supplied 35.7 percent of the large roundfish and 31.2 percent of the small roundfish. Fresh herring is mainly landed by West Germany; between 1954 and 1958 the West German landings accounted for 68.0 percent of the total landings of herring in Common Market Countries, followed by France and the Netherlands.

For the supply of salted herring, the Netherlands are of paramount importance (account for 62.8 percent of the total landings). Sardines are supplied by Italy and France only. For flatfish the Netherlands accounts for 36.5 percent of the total landings, while the landings by France and Belgium are at about the same level (12,000 to



Fig. 8 - Conveyors used for unloading herring from fishing vessels at Hamburg-Altona fish harbor.

13,000 tons). The Netherlands and West Germany take an important place in the Common Market for the production of shrimp while mussel fisheries are mainly carried on in the Netherlands.

²²Sources: "OECD-Fish Marketing in Western Europe Since 1950," Paris, p. 23.

EX-VESSEL PRICES

French ex-vessel or landed prices for fishery products from the sea are very high in comparison with those in the other Common Market Countries. For salted herring and mackerel, the Netherlands reports the lowest prices. For flatfish, large roundfish, fresh herring, and shrimp, German prices are the lowest.

At the coastal fish markets, ex-vessel prices are determined at auction sales. But as the prices at the point of landing depend on many factors, wide fluctuations are characteristic.

In order to obtain a certain stability of prices, Belgium, France^{23/}, the Netherlands, and West Germany have established a system of minimum ex-vessel or landed prices for certain sea products. The system only aims at giving a "bottom" to the market and works rather simply. The products which do not obtain the minimum price by auction sales are not sold for human consumption, but are disposed of at a much lower price to fish-meal factories. The difference between the minimum price and the price obtained from fish-meal factories is paid from a special fund (equalization fund). The fund is financed by a special levy on the value of the fish sold at auctions. In Belgium the minimum prices are fixed by a shipowners' union in deliberation with the Ministry of Agriculture. In the Netherlands they are fixed by the Marketing Board for Fishery Products; there are however also minimum prices (e.g. for sprat and for salted herring) which are fixed by the owners' associations. In West Germany the Government fixes the prices on the basis of the Fisheries Law of August 31, 1955.

INTERNAL TRADE, UTILIZATION, AND CONSUMPTION

The landings of fishery production in the Common Market Countries are supplemented by imports, while a part are destined for export. The organization and the supply of the domestic markets in each country varies widely from one country to another. Generally speaking, the fishery products reach the consumer through a chain of wholesalers, importers, or exporters; and retailers or hawkers.

In West Germany much attention is given to the vertical structure of the fishing industry; this is estimated of essential importance for the profitability of the industry. A vertical structure means that shipowners have financial interests in catching activities, in the wholesale trade, in the processing industries, and even in the retail trade. In other Common Market Countries (the Netherlands and France, e.g.) efforts for a similar organization are continued.

The processing industries are more developed in one country than in another of the Common Market Countries, but generally the same industries are found in all the countries. In the Common Market the processing industries can still be further developed. This is clear from the enormous amount of fish which is sold fresh. Table 5 shows the utilization of the landings.

In the Common Market about 60 percent of the landings are marketed fresh and not even 2 percent are frozen. In Italy and Belgium fish is mostly sold fresh--86.7 percent and 75.2 percent of the landings, respectively. The Netherlands leads all the other countries in the utilization of fishery landings for dried, smoked, or salted fish, and also for fish meal and oil. France leads in the amount used for canning.

^{23/}In France there is an arrangement on landed prices in a limited number of ports.

Table 5 - Percentage of Utilization of the Fishery Landings in Common Market Countries, 1958^{1/}

Country	For Fresh Market	For Freezing	For Curing	For Canning	For Reduction	For Other Purposes
Belgium ^{2/} . . .	75.2	7.8	12.5	2.9	1.6	-
France ^{3/} . . .	5/60.4	-	27.9	11.7	-	-
Italy	86.7	1.9	7.2	4.2	-	-
Netherlands . . .	48.5	3.5	30.6	6.4	5.3	5.7
W. Germany ^{4/} . .	-	-	-	-	-	-
Total	63.0	1.9	23.7	8.2	1.6	1.6

^{1/}Source: FAO Yearbook of Fishery Statistics, 1958, vol. IX.

^{2/}1955.

^{3/}Includes Algeria.

^{4/}Not available.

^{5/}Marketed fresh and for freezing.

Table 6 - Per Capita Consumption of Fishery Products in Common Market Countries, 1955-56^{1/}

Country	Pounds
Belgium and Luxemburg	33.7
France	32.3
Italy	27.3
The Netherlands	28.6
W. Germany	35.0

1/ Source: *Fish Marketing in Western Europe Since 1950*, p. 54. Organization of European Economic Cooperation, Paris.

The consumption of fish is at a low level in the Common Market Countries (table 6).

Italy has the lowest per capita consumption while West Germany has the highest. In Belgium the consumption is practically as high as in West Germany.

In the future the consumption of fish can increase in the Common Market. The chief factors which can contribute to an increase are: good quality, ready-to-cook products, regular supply of reasonably-priced fish, and well-planned advertising.

FOREIGN TRADE

The Common Market's trade balance for fishery products shows a considerable import surplus--for the years 1956-58, the Common Market had an annual average import surplus of 189,200 tons. Table 7 shows the average imports and exports of fishery products per country for the years 1956-58.

The two main fish-importing countries in the Common Market are West Germany and Italy--during the years 1956-58, those countries imported on the average 122,900 tons and 123,500 tons, respectively. France also imports large quantities of sea products (91,000 tons). In West Germany the annual average exports were about 41,700 tons. Italy, on the contrary, only exported 1,600 tons, so that she has the largest import surplus of the Common Market (-121,900 tons).

The Netherlands is the most important exporter of marine products in the Common Market--for the years 1956-58, 151,100 tons on the average. Her imports only amounted to 21,100 tons. The Netherlands is the only country in the Common Market to report an export surplus on the trade balance for marine products.

During the last five years, from 1954 to 1958, the fishery products imports in the Common Market increased from 376,976 tons to 455,049 tons; an increase of 20.7 percent. The peak year for imports was 1958.

Table 8 - Common Market Fishery Imports and Exports by Commodity Groups and by Country, Annual Averages 1956-58^{1/}

Commodity Groups	Belgium	France	Italy	Netherlands	West Germany	Total
(1,000 Metric Tons)						
Imports						
Fresh fish ^{2/}	12.3	31.3	34.3	7.5	20.5	105.9
Fresh herring	6.5	3/	3/	3.0	69.3	78.8
Salted, dried or smoked herring	12.8	4.4	3.7	0.8	11.4	33.1
Other processed fish	3.2	0.6	57.9	0.4	1.7	63.8
Canned fish	17.5	23.4	24.1	3.7	19.4	88.1
Molluscs and crustaceans	25.1	31.4	3.5	5.7	0.6	66.3
Total	77.4	91.1	123.5	21.1	122.9	436.0
Exports						
Fresh fish ^{2/}	7.5	2.0	0.4	16.2	20.3	46.4
Fresh herring	1.5	3/	3/	21.5	0.6	23.6
Salted, dried or smoked herring	0.7	0.4	-	49.0	2.3	52.4
Other processed fish	2.9	28.4	-	1.0	6.4	38.7
Canned fish	0.7	3.2	0.9	13.0	7.5	25.3
Molluscs and crustaceans	1.2	3.9	0.3	50.4	4.6	60.4
Total	14.5	37.9	1.6	151.1	41.7	246.8

1/ Source: National statistics.

2/ I.e. fresh and frozen fish, excluding fresh herring.

3/ Included with fresh fish.

Table 7 - The Common Market's Fishery Imports and Exports by Country, Annual Averages 1956-58^{1/}

Country	Imports	Exports	Net Import (-) Net Export (+)
(1,000 Metric Tons)			
Belgium	77.4	14.5	- 62.9
France	91.1	37.9	- 53.2
Italy	123.5	1.6	- 121.9
Netherlands	21.1	151.1	+130.0
W. Germany	122.9	41.7	- 81.2
Total	436.0	246.8	189.2

1/ Excludes fresh-water fish, caviar, and fish meal.

Source: National statistics.

In 1958, the Common Market fishery exports were equal to those of 1954 (about 257,600 tons); in 1955, 1956, and 1957 they were at a lower level.

COMPOSITION OF IMPORTS AND EXPORTS: The composition of imports and exports in the Common Market as a whole is not the same; imports and exports vary also widely from one country to another.

About 24.3 percent of the imports of the Common Market consist of fresh fish (excluding herring), followed by canned fish, fresh herring, molluscs and crustaceans, processed fish and salted, dried or smoked herring.

About 24.5 percent of the exports of the Common Market consist of molluscs and crustaceans, followed by salted, dried or smoked herring, fresh fish, processed fish, canned fish, and fresh herring.

SOURCE OF IMPORTS--DESTINATION OF EXPORTS: The source of imports and the destination of exports of the Common Market as a whole and for each country separately vary considerably.

Table 9 - Common Market Fishery Imports by Country of Origin and Exports by Country of Destination, Annual Averages 1956-58¹

Country	Imports		Exports	
	From Common Market Countries	From Other Countries	From Common Market Countries	From Other Countries
Belgium . .	55.8	21.6	9.3	5.2
France . .	39.5	51.6	12.4	25.4
Italy . . .	21.6	101.9	0.3	1.3
Netherlands	8.0	13.1	107.3	43.8
W. Germany	27.8	95.1	20.5	21.2
Total .	152.7	283.3	149.8	96.9

¹/Sources: National statistics.

ties, especially molluscs and crustaceans, are supplied by the Netherlands. In Italy and the Netherlands, respectively, 17.5 percent and 37.9 percent of the imports come from the Common Market countries. For Italy, France (processed fish) and West Germany are the important suppliers. For the Netherlands, West Germany (fresh fish) and Belgium are the principal suppliers. West Germany imports 22.6 percent of her imports from member countries, especially from the Netherlands (fresh and salted herring) and Belgium. Nonmember countries mainly supply Italy (82.5 percent of her total imports), the Netherlands (62.1 percent of her imports), and West Germany (77.4 percent of her imports).

About 60 percent of the exports of the Common Market Countries are destined for member countries and about 40 percent to other countries. Belgium sells 64.1 percent of her exports to the Common Market. France is the most important market for Belgium (especially for fresh fish). France exports 32.7 percent to member countries, with Italy her best customer. Italy is not important as an exporter. The Netherlands, on the contrary, sells more than 71.0 percent of her exports to member countries. Her principal markets are Belgium, France, West Germany, and Italy. West Germany has an outlet in the Common Market for about 49.2 percent of her exports, and her best customers are Italy and France. As an outlet for sea products, nonmember countries are important to Italy, France, and West Germany.



Fig. 9 - Trawl doors and other vessel supplies on dock at Hamburg.

TRADE BARRIERS

The import duties and quota restrictions still protect the national fishing industries in the Common Market. Import duties on fishery products are still rather high in the Common Market, except for Belgium and the Netherlands²⁴. Moreover, they include many products.
²⁴In Belgium and the Netherlands there are only duties on canned goods and on certain species of molluscs and crustaceans.

In France the import duties vary between 9 (certain species of molluscs and crustaceans) and 31.5 percent (fillets); in Italy between 0 and 27 percent (canned fish); in West Germany between 0 and 27 percent (certain species of molluscs and crustaceans). The imports are also subject to other duties, e.g. fiscal taxes (Belgium and the Netherlands); sales taxes (West Germany); taxes for sanitary control and inspections (in France); statistical levy (in Italy).

The Common Market countries have agreed to establish a common external tariff. For most of the fishery products there was an agreement on the external tariff by the signing of the Treaty; for other products--fresh fish and salted, dried or smoked fish--the level of the tariff would be fixed by negotiations²⁵.

Recently an agreement was reached on the level of the external tariff for those products. For the Benelux-countries the external tariff includes a stronger protection, while for other countries, France in particular, the protection will be weaker.

On January 1, 1959, the quota restrictions were extended, but the imports are at the moment more liberalized in one member country than in another. The intra-Benelux fish trade is liberalized, but the Benelux-countries still have quota restrictions for fresh fish (excluding sprat), fresh herring, salted, dried or smoked herring, and shrimp. West Germany has import quotas for salted herring and herring fillets, dried fish, and shrimp; France has restrictions for fresh fish, canned fish, and certain species of dried fish.

CONCLUSION

In order to establish a Common Market for the fishing industry, certain adjustments inevitably will be necessary. The development of the fishing industry in the Common Market can, however, hardly be foreseen for the moment; many factors will have an influence, while uncertainty still prevails about the interpretation of many provisions of the Treaty of Rome. This is especially so for the provisions about the common policy for the fishing industry. The Treaty provides for three possibilities of a common policy: (1) common rules concerning competition; (2) coordination of the national market organizations; (3) a European market organization. Whichever possibility will be chosen, the aims of common policy will be tied to it. The aims are: (1) increase of productivity; (2) reasonable standard of living for those engaged in the fishing industry; (3) stabilization of the market; (4) a regular supply; and (5) reasonable prices to the consumers.

The extension of the Common Market for the fishing industry will further depend on the coordination of all regulations in the industry. Up till now the governmental and private regulations differ from each other. Moreover, numerous practices are not fully understood nor easily determined.

Uniform regulations together with an over-all European policy, however, will make possible complete understanding between the member countries, and at the same time allow fisheries to develop.

²⁵/Article 20.



FIRST OYSTERS IMPORTED FROM JAPAN FOR CULTIVATION

Professor Mitsukuri of the Imperial University of Tokyo suggested in 1899 that oysters from Akkeshi Hokkaido, a northern island, would be best adapted for transportation to America. In 1902, four carloads of Japanese oysters were planted in Puget Sound on the west coast of the United States. The following year 12 carloads were planted, and the practice has continued, with success, on a much larger scale.

--"Sea Secrets," The Marine Laboratory,
University of Miami, Coral Gables, Fla.

TRENDS AND DEVELOPMENTS

American Samoa

TUNA LANDINGS, JULY 1960:

Tuna landings by Japanese long-line fishing vessels for the United States-owned tuna cannery in American Samoa amounted to 1.8 million pounds in July 1960 as compared with about 2.7 million pounds in July 1959. The January-July 1960 total of 15.4 million pounds was up 3.5 percent from the same period of 1959.

Species	American Samoa Tuna Landings, July 1960		Jan.-July	
	July 1960	1959	1960	1959
Albacore	1,597	2,208	12,655	11,286
Yellowfin	172	388	1,601	2,902
Big-eyed	57	68	1,112	672
Skipjack	-	-	-	1/
Total	1,826	2,664	15,378	14,860

1/Less than 500 pounds.
Note: All of the tuna landed in July 1960 was by Japanese long-line vessels.

California

PHYSIOLOGICAL STUDY OF PACIFIC SALMON:

M/V "Nautilus" Cruise 60N6: The area off San Francisco (Muir Beach to Pedro Point) was surveyed from July 12-14, 1960, by the California Department of Fish and Game's research vessel Nautilus to obtain and keep alive, for physiological experiments, immature, ocean-caught chinook salmon. The fish were to be brought aboard without sustaining an obviously damaging injury and with minimum exertion on their part, to be held under conditions which would facilitate their return to a state of physical rest. Another objective was to examine chinook salmon in the 20-22 inch size range to determine their sex and stage of maturity.

In the course of three days' fishing, more than 100 chinook salmon were caught; 31 were successfully held in a large live-bait tank for varying lengths of time, up to 56 hours, and 22 others were examined for stage

of maturity and sex. Most of the latter had sustained serious injuries while being caught or landed. All other fish were released without being brought aboard or handled. This was accomplished by use of the so-called button-hook fish releaser.

Of the 22 fish examined, 17 were males (77 percent), and every fish was immature (would not spawn in 1960).

One marked salmon was captured. It had been one of about 250,000 fingerlings trucked to, and released in, lower San Francisco Bay early in 1959. When captured, it was 23 inches long, weighed 4.5 pounds and was in its second year of life.

During the last day, a team of scientists conducted physiological studies of fish which had been held for this purpose in the live-bait tank. The objective of the studies is to obtain knowledge about the cause of aging and death of an organism with particular reference to Pacific salmon.



Cans--Shipments for Fishery Products,

January-June 1960

Total shipments of metal cans during January-June 1960 amounted to 60,560 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 53,815 tons in the same period a year ago. The increase of about 12.5 percent in the total shipments of metal cans January-June this year as compared with the same period of 1959 was probable due to orders in anticipation of a sharp increase in the Alaska canned salmon pack.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fisheries Investigations

STUDIES INITIATED ON GENETIC DEFINITION OF TUNA STOCKS:

An intensive study of Pacific tuna species with reference to the hereditary composition of tuna stocks was started recently by the U. S. Bureau of Commercial Fisheries.

Geneticists in the recently-implemented program at the Bureau's Honolulu Biological Laboratory report a major advance in the study of skipjack tuna populations with the development of a battery of serological test fluids which will detect complex patterns of individual differences between the red blood cells of different skipjack. These antigenic differences analogous to those found in man (A-B-O, etc.) and other vertebrates are the products of the units of inheritance (genes).

Laboratory scientists report that a study of the frequency with which the various characters occur in tuna populations will lead to a genetic definition of tuna stocks. Such a definition may allow a more sophisticated study to be made of growth, recruitment, and mortality rates which may be unique for different racial or genetic stocks within the same species.

The antigenic characters themselves which are in a sense analogous to "natural" tags on the population level may also yield important information regarding the geographic distribution and migration of the tunas.

Preliminary studies have been carried out by the Honolulu Laboratory and visiting university scientists on a small scale since 1955 and more recently with the La Jolla, Calif., Biological Laboratory of the Bureau.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JUNE 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the De-

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, June 1960 with Comparisons

	Quantity		Value			
	June 1960	Jan.-June 1960	June 1960	Jan.-June 1959	June 1960	Jan.-June 1959
Tuna	166	-	1,449	1,832	75	-
Salmon	3	5	3	12	2	4
Sardines	22	160	84	669	9	28
					35	100
	(1,000 Lbs.)		(\$1,000)		(\$1,000)	
	2,718	2,212	11,740	11,346	1,195	1,170
						5,986
						5,987

partment of Defense, 2.8 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in June 1960 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in May by 27.7 percent, and was 22.9 percent greater than the amount purchased in June last year. The value of the purchases this June was 8.3 percent greater than the previous month and 2.1 percent more than for June 1959.

During the first six months of 1960 purchases totaled 11.7 million pounds (valued at almost \$6.0 million)--an increase of 3.5 percent in quantity and no change in value as compared with the same period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in June 1960 averaged 44.0 cents a pound, 7.8 cents less than the 51.8 cents paid in May and 8.9 cents less than the 52.9 cents paid during June 1960.

In June, the Agency also bought 2,000 pounds (valued at \$15,000) of dehydrated fish for experimental purposes.

Canned Fishery Products: Tuna was the principal canned fishery product purchased

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, June 1960 with Comparisons

Product	Quantity		Value	
	June 1960	Jan.-June 1960	June 1960	Jan.-June 1959
Tuna	166	-	1,449	1,832
Salmon	3	5	3	12
Sardines	22	160	84	669
	(1,000 Lbs.)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-	1,449	1,832
	(\$1,000)		(\$1,000)	
	166	-		

the Interior, was announced on August 3, 1960, by Bureau Director Daniel H. Jansen.

Stevenson will be in charge of the Bureau's research program into many of the problems of raising fish in conjunction with the growing of rice and other agriculture crops. Some of the problems to be worked out include effects of water quality and levels; control of aquatic vegetation; overpopulation; predation; intrusion of unwanted species of wild fish; disease and parasite infestations; proper stocking levels; nutritional requirements along with feeding materials and methods; spawning requirements and methods of controlling or inducing spawning; and brood stock selection.

The two tracts of land acquired by the Bureau for the fish farming experiments total 296 acres. One of the purchased tracts comprises 85 acres immediately adjacent to the University of Arkansas' Rice Branch Experiment Station near Stuttgart. The second tract, which is of a different soil type, is 211 acres adjoining the University's Southeast Branch Experiment Station at Kelso.

The Stuttgart property will have a modern laboratory; fish-holding facilities; a building for shop, garage and storage; a reservoir of about 30 acres; and experimental ponds ranging from one-tenth acre to one acre in surface area. The Kelso land has a high producing well and an adequate surface water supply. Levees have been constructed on three sides of 160 acres of the plot. Five, ten, and twenty-acre reservoirs are planned for the site.

Stevenson, who was formerly head of the Department of Zoology at Little Rock University and biologist for the Arkansas Game and Fish Commission, recently returned from a five-month assignment with the International Cooperation Administration to advise the government of Pakistan on development of its inland fisheries.

* * * * *

CONTRACT LET FOR NEW EXPERIMENTAL STATION IN ARKANSAS:

A contract was executed on June 10, 1960, for first-phase construction for the new Fish Farming Experimental Station near Stuttgart, Arkansas. Specifications call for completion of the two headquarters buildings. One will contain offices and laboratories for biology, chemistry, and disease and parasite research; the other a combination building, will house a small shop, garage, storage, and fish-holding tanks.

Second-phase construction, for which bids will be solicited in the near future, will include a 30-acre reservoir, and three series of one-tenth, one-quarter, and one-acre experimental ponds, complete with water-supply system.



Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY FISHING WITH OTTER TRAWL STARTED IN LAKE MICHIGAN:

M/V "Art Swaer II" Cruise 1: The U. S. Bureau of Commercial Fisheries inaugurated the Lake Michigan Exploratory Fishing and Gear Research Program with the cruise of a chartered Lake Michigan commercial gill-net tug that has recently been adapted to the newly-introduced otter-trawl method of fishing. On August 10, 1960, the chartered vessel, *Art Swaer II*, was scheduled to start a seven-day trawl fish exploratory cruise.

Exploratory fishing operations were carried out in eastern Lake Michigan at depths from 10 to 50 fathoms. The operational area was confined to waters between Ludington and South Haven.

The objectives of the cruise were to determine the distribution and abundance of the various species of fish that can be taken with otter trawls in that area at this time of year. Special effort was made to assess the potential yield of fish stocks that are presently only slightly exploited on a commercial basis. The characteristics of the lake bottom was analyzed and charted to show the location and extent of areas suitable for otter trawling.

Standard commercial Gulf of Mexico-type semiballoon fish trawls with 70-foot footropes were used. Electronic depth-recorders were employed to determine lake-bottom characteristics and the vertical distribution of fish.



Great Lakes Fishery Investigations

CHEMICAL CONTROL PROGRAM FOR SEA LAMPREY ON SCHEDULE:

Progress in the Great Lakes chemical-control program for sea lamprey makes it apparent that the goal of treating all known lamprey-spawning streams tributary to the United States shore of Lake Superior in

1960 will be reached. Two of the most difficult treatments were completed in July-1960—the Bad River-White River system in Wisconsin and the Ontonagon River in Michigan. Two smaller streams were also treated.

* * * * *

EXPERIMENTAL TRAWLING REVEALS SPAWNING SUCCESS OF CERTAIN SPECIES:

Experimental trawling in Green Bay, Lake Michigan, and in Lake Erie has given some indication of the success of the 1960 spawning of certain Great Lakes species. As of August, no 1960 yellow pike had been taken in Green Bay even on grounds that yielded many young-of-the-year in 1959. Young yellow perch had been caught but in very small numbers. Juvenile smelt were extremely plentiful. Yellow pike of the 1960 year-class were taken at a number of localities in western Lake Erie, but in such small numbers as to indicate spawning success far below that of 1959. Reproduction seems to have been poor also in the spottail shiner and possibly the sheepshead. Young yellow perch had been caught in good numbers but were less plentiful than in 1959. Catches of the young-of-the-year white bass and smelt were very large.

* * * * *

LAKE ERIE FISH POPULATION SURVEY:

M/V "George L." May-June 1960: Extensive trawling operations were conducted by the U. S. Bureau of Commercial Fisheries research vessel George L. and commercial fish catches were examined in May and June. United States commercial catches of yellow perch, sheepshead, carp, channel catfish, and white bass have been good. Yellow pike catches were about one-half of those last spring and catches of blue pike, cisco, and whitefish have been very light.

Yearling yellow pike (hatched in 1959) continue to appear in large numbers in commercial trap nets in the western basin. Great variations in catch from week to week in the same areas indicate that the yellow pike move about continuously in loosely-formed groups. The average length of yearling yellow pike taken in trap nets in late June was about 11½ inches. Several 13-inch yearling fish have been landed by commercial fishermen. At the present rate of growth ($\frac{1}{2}$ inch per month), most of those fish should exceed 13 inches by September 1.

Trawl catches continue to demonstrate the great abundance of yellow perch hatched in 1959. These fish now average about 5 inches long and should enter the commercial catch in late 1961. Trawl catches of large numbers of white bass hatched in both 1958 and 1959 indicate that a commercial production of this species should continue to be good in 1960 and 1961. The catch of 5- to 8-inch smelt in May and early June in western Lake Erie far exceeded catches during the same period in 1958-59.

Catches of fry and small fish by tow nets in May and by trawls in June revealed an exceptional hatch of smelt in the western basin this spring compared to last year. Yellow perch fry are appearing in goodly numbers but young yellow pike are relatively scarce compared to last year. Sheepshead eggs, which float on the wa-

ter's surface, have been taken earlier, in larger numbers, and over a wider area than last year. White bass, gizzard shad, and spottail shiner fry were also taken in late June.

Most yellow perch were in poor condition in May but since have fed heavily on animal plankton and now appear relatively plump. Yearling white bass (4-7 inches long) are feeding heavily on newly-hatched smelt and yellow perch. Yearling yellow pike have fed principally upon emerald and spottail shiners.

Trawling was to be continued during the summer to determine semi-monthly changes in relative abundance, growth, and food of important fish species.

M/V "George L." July 1960: Surface water temperatures were nearly constant at 75° F. in western Lake Erie during July. Average July air temperatures at Sandusky were coolest since 1947. Winds during the month were light. Low oxygen concentrations (lowest 0.5 p.p.m.) were observed in the Central and Western basins.

Commercial catches of most fish were light. Yearling yellow pike averaging 12 inches long were common in the trap-net catches in the Island Region. The largest yearling yellow pike observed was 13.7 inches long. Yearling yellow pike taken in Eastern waters (Cleveland to Dunkirk) range from about 9-11 inches long.

Ninety-two (2.3 percent) of the 4,000 yearling yellow pike tagged in April have been recovered. One fish was taken in Lake St. Clair—another taken from Lorain was the most easterly tag recovery reported.

Yearling yellow perch and white bass are very abundant in all waters of Western Lake Erie. Up to 9,000 yearling yellow perch averaging about six inches long have been observed in single trap-net catches.

Large numbers of white bass and smelt young-of-the-year were taken by trawl in July. Trawl catches of young-of-the-year yellow pike were much lower than in 1959 but appeared in somewhat greater numbers than in 1957 and 1958. The 1960 hatch averaged about 5 inches long by July 31—equal to the growth of the 1959 hatch a year ago.

The lowest total commercial catch of yellow pike on record in Lake Erie was previously reported to be 422,000 pounds in 1913, but the records for that year were incomplete. Ohio reported only the fall catches that year. Further examination of the records shows that total yellow pike commercial production in 1959 (about 1,500,000 pounds) was greater than in seven prior years (1918-21 and 1928-30). Lowest production was 744,416 pounds in 1919. Low production of yellow pike in Lake Erie, then, is not new.

Note: Also see Commercial Fisheries Review, July 1960 p. 28.

* * * * *

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 4: The fish population survey in southern Lake Michigan was continued (June 28-July 12, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco.

Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, and 300 feet each of 2-, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Grand Haven, Mich., and at the same depths off Racine, Wis. Off Grand Haven the catch at 25 fathoms was light (314 *Leucichthys hoyi*, 2 *L. alpenae*, 1 *L. zenithicus*, 2 lake herring), but at 50 fathoms the catch was rather large (1,089 *L. hoyi*, 13 *L. reighardi*, 17 *L. alpenae*, 7 *L. zenithicus*, 9 lake herring). Off Racine the catches were very light (about 200 *L. hoyi* at each depth, 4 smelt at 25 fathoms, and 2 *L. reighardi*, 3 *L. alpenae*, 2 *L. kiyi*, and 7 lake herring at 50 fathoms).

Gangs of linen nets were set for 4 nights at 25 and 50 fathoms off Grand Haven (255 feet each of $2\frac{1}{8}$ -, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, and 3-inch mesh at the former depth and twice that amount of each mesh size at the latter). The 25-fathom net took 151 *L. hoyi* and *L. alpenae*. An identical set at the same time of year in 1954 took 426 *L. hoyi*, 7 *L. alpenae*, 11 *L. reighardi*, and 1 *L. kiyi*. The set at 50 fathoms, with which no 1954 comparison is possible, caught 758 *L. hoyi*, 21 *L. zenithicus*, 12 *L. alpenae*, 8 *L. reighardi*, and 12 lake herring.

A 52-foot commercial-type balloon trawl was towed at 5-fathom intervals from 15 to 35 fathoms west-southwest of Grand Haven, at 30 and 40 fathoms northeast of Racine, at 25, 30, 35, 40, and 50 fathoms west of Milwaukee, and at 12, 15, and 20 fathoms near shore north of Milwaukee. All tows were for 30 minutes. The chub catches from 20 fathoms and deeper were mostly small, ranging from 60 to 250 pounds. At 15 fathoms off Grand Haven 367 pounds were caught, and at 12 and 15 fathoms north of Milwaukee, 446 and 524 pounds, respectively, were taken. The larger catches in the shallower water are accounted for by appreciably greater numbers of small (7 to 8 inches) fish than were present in the catches from deeper water. Apparently in depths greater than about 15 fathoms, a large portion of the small chubs were midwater, thus not vulnerable to the bottom trawl. The chub catches were more than 95 percent bloater (*L. hoyi*) in all catches and were almost pure bloaters in the shallower tows. The commercial-trawl catches were practically devoid of species other than chubs, except in the 50-fathom tow off Milwaukee where 20 pounds of deep-water sculpins were caught, and in 12 and 15 fathoms north of Milwaukee, where 12 and 30 pounds, respectively, of smelt were taken.

An experimental 39-foot semi-balloon trawl with a small-mesh ($\frac{1}{2}$ -inch) cod end was towed in shallow water south of Grand Haven. At 15 fathoms, a 30-minute tow netted 285 pounds of chubs; at 10 fathoms a 10-minute tow produced small numbers of perch and about 15 pounds of very small chubs, more than half of which were less than 7 inches long. At 5 and 7 fathoms the catches were predominately yellow perch, smelt, and alewives, together with a few spottail shiners, trout-perch, and log-perch.

Complete hydrographic collections and observations were made at 25-fathom stations off Grand Haven and Racine, and at 70 fathoms in midlake between these ports. Pronounced thermal stratification existed in all areas visited, but in many cases the epilimnion was quite thin. At the end of the cruise surface temperatures were mostly 16° to 17° C. (average about 62° F.) on the west side of southern Lake Michigan and 19° to 20° C. (average about 67° F.) on the east side.

Sampling of the bottom fauna off Grand Haven was made with a Peterson dredge and a Smith-McIntyre

dredge at 5-fathom-depth intervals from 5 to 30 fathoms and at 3 and 50 fathoms. The Smith-McIntyre dredge was borrowed from the Bureau Laboratory at Woods Hole, Mass., to ascertain its suitability for use in the Great Lakes. This sampler undoubtedly operates more effectively in rough seas than does the Petersen dredge, but it is too heavy and bulky for practical use and storage aboard the *Cisco*.

M/V "Cisco" Cruise 5: The survey continued during July 19-August 2, 1960. Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch, 200 feet of 2-inch, and 300 feet each of $2\frac{1}{8}$ -, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set at 25 and 50 fathoms off Grand Haven, Mich., and off St. Joseph, Mich. Chub catches were heavier in the 25-fathom sets. Bloaters (*Leucichthys hoyi*) made up more than 95 percent of the catches, except in the 25-fathom set off St. Joseph, where about 75 percent of the chubs were bloaters. The remainder of the chubs in this latter set were rather difficult to identify, but were mostly *L. zenithicus*; there were also a few *L. alpenae* and *L. reighardi*, and a considerable number of lake herring. A few smelt and deep-water sculpins also were taken.

Linen gill nets of several mesh sizes from $2\frac{1}{8}$ - to 3-inch, set for 5 nights off Grand Haven, took about 15 to 50 percent more bloaters at 25 and 50 fathoms, respectively, than did identical gangs set in 1954 at the same time of year. For other species of chubs the following comparisons were obtained: at 25 fathoms, all were much more common in the 1954 set; at 50 fathoms, all non-bloater species except *L. kiyi* were somewhat more numerous in the 1960 set. *L. kiyi* was more common in 1954 (172 vs. 10 in 1960).

In order to study differences in gill-net catches with differences in lengths of time set, and also to determine variations in identical 1-night sets on successive nights, nylon gill nets were fished as follows: on the first day 4 gangs were set at 25 fathoms off Grand Haven; on the second day, 1 gang was lifted and reset; on the third day the 1-night set and a 2-night set were lifted, and 1 was reset; on the fourth day the 1-night set and a 3-night set were lifted, and 1 reset; on the fifth day the remaining gangs, a 1-night and a 4-night set, were lifted. Chub catches in the 1-night sets were 432, 429, 437, and 338, respectively. The 2-night set took 756 chubs; the 3-night set 1,000; and the 4-night set 1,140. The $1\frac{1}{4}$ - and 2-inch meshes (especially the latter) appeared to have lost fishing efficiency entirely after the third night, but the other larger meshes took appreciably more fish in the 4-night set than in the 3-night one.

A 52-foot commercial-type balloon trawl was towed at 5-fathom intervals from 15 to 35 fathoms northwest of St. Joseph and from 10 to 50 fathoms southwest of Grand Haven. All tows were for 30 minutes. Bloaters made up more than 95 percent of all chub catches. The chub catches off St. Joseph ranged from 110 pounds at 20 fathoms to 460 pounds at 35 fathoms. Other species taken in the trawls off St. Joseph were lake herring (27 pounds at 35 fathoms), smelt (about 5 pounds per tow at 15 and 25 fathoms), and a few perch, deep-water sculpins, and slimy sculpins. Chub catches off Grand Haven were generally light, ranging from 24 to 64 pounds at 50 and 45 fathoms, respectively, and from 296 to 256 pounds at 25 and 20 fathoms, respectively. Some 48 pounds of deep-water sculpins were taken at 50 fathoms, and 28 pounds at 45 fathoms; otherwise, there was little other than chubs in the catches.

A half-meter, large-mesh (No. 32 grit gauze) plankton net was towed for fish fry at various depths from the surface to 20 meters near shore south of Grand Haven. Very tiny fry were quite numerous at depths from 1 to 5 meters, but none were obtained in repeated tows at the surface and at depths greater than 5 meters.

Hydrographic observations and collections were made at regular 25-fathom stations off Grand Haven and St. Joseph. Phytoplankton was considerably less abundant than during previous cruises. Surface water was rather warm; temperatures were mostly between 19° and 21° C. (66.2° and 69.8° F.).

Note: Also see *Commercial Fisheries Review*, Sept. 1960 pp. 21-22.

* * * * *

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 3: To study the bathymetric and areal distribution of fish by systematically fishing standard gangs of experimental gill nets (1- to 5-inch mesh by $\frac{1}{2}$ -inch intervals) at various locations and depths in western Lake Superior was the objective of the second of three cruises scheduled by the U. S. Bureau of Commercial Fisheries research vessel Siscowet June 28-14, 1960.

The work was performed at four stations near Ontonagon, Mich., and at three stations in the Apostle Island region. The work also included fishing with trawls from the *Siscowet* and the outboard-powered skiff, and tests of an electrical boom-shocker for sampling fish in shallow areas adjacent to shore.

The "bloater" (*Leucichthys hoyi*) taken in the 17-fathom set were very similar to those taken in Pike's Bay near Bayfield. This shallow-water variety has larger eyes (nearly as large as in *L. kiyi*), less pigment on the head, and is a heavier, more solid fish than the deep-water variety. The "bloater" taken in the Ontonagon area also appeared to be late-winter or spring spawners. Large numbers of "bloaters" in the Apostle Island area have been observed spawning with the lake herring in the late fall.

Comparisons were made of the catch from a 1- and 2-night set at the station located at 52 fathoms and from 2 successive 1-night sets at the stations located at 25 and 72 fathoms. In each test the nets were set in exactly the same location and depth. Changing weather conditions, however, during the period may have had some effect on the results of the experiment. Only three varieties of chubs are used for the comparison that follows because of the very small numbers of other species taken.

The 2-night catch at 52 fathoms took over twice as many fish as the 1-night set. The second of two 1-night sets at 25 fathoms took 14 percent more fish than the preceding night and the second 1-night set at 72 fathoms took 26 percent more fish than the preceding night.

A 30-foot semiballoon trawl (1-inch-mesh body and a $\frac{1}{2}$ -inch-mesh cod end) fished just west of Outer Island at 9 to 25 fathoms took one 2-inch whitefish but no lake trout. The catch consisted mainly of slimy mudlars, trout-perch, and ninespine sticklebacks.

Through the cooperation of the Wisconsin Conservation Department, an electrical boom-shocker was operated at the mouth of the Bad River and in the shallow waters adjacent to Stockton Island in an attempt to locate young-of-the-year of several species. Although the shocker took no young-of-the-year, it did turn up a considerable variety of fish.

River species mainly were taken at the mouth of the Bad River--smallmouth bass, northern pike, yellow pike (yearlings), black crappie, and spot-tail shiners. No fish were taken in the lake proper off the mouth of the Bad River.

Shocking operations at Stockton Island were conducted after dark in water 3 to 8 feet deep over rock and sand bottoms. Over the rock bottom the shocker took trout-perch, 6- to 8-inch round whitefish, 6- to 10-inch burbot, and 1- to 8-inch longnose suckers. Over the sand bottom the shocker uncovered thousands of small (3 to 6 inches) smelt and 3 large brown trout, apparently in shallow water feeding on the smelt. Other species taken over the sand bottom were ninespine sticklebacks, lake northern chub, and trout-perch.

Shocking operations off Stockton Island the following morning (during daylight hours) took very few fish (slimy mudlars, ninespine sticklebacks, and burbot). No smelt were caught during the daylight fishing.

Trawl tows with the outboard skiff at 15 and 20 feet yielded only a very few ninespine stickleback and slimy mudlars.

Surface water temperatures varied from 39.6° F. northwest of Ontonagon to 59.8° F. south of Stockton Island. Bottom temperatures remained about 40° F. in all areas.

M/V "Siscowet" Cruise 4: Midsummer environmental conditions were studied July 18-25, 1960, at three index stations located southeast of Stockton Island, northeast of Bear Island, and east of Pike's Bay. These studies included fishing with standard gill-net gangs and a 30-foot semiballoon trawl. Limnological data and materials were collected including: records on water temperatures, water samples for chemical analyses, plankton and bottom samples, and Secchi-disc readings.

Secchi-disc readings were comparatively low at each station, undoubtedly due to a heavy plankton concentration in the upper layers of the water. Dissolved oxygen was found to be lowest at the surface at all stations (about 10.4 p.p.m.). The oxygen content of samples taken at or near the bottom was about 12.7 p.p.m.

In addition to the sets made at each index station, standard gangs were fished north of Devil's Island at 37 and 58 fathoms, and east of Gull Island at 15, 25, 45, and 55 fathoms.

The lake herring caught east of Gull Island at 15 fathoms averaged $\frac{1}{2}$ -pound each. One herring measured 17.9 inches and weighed 1.8 pounds. The *Leucichthys zenithicus* caught east of Gull Island were found to be in all stages of sexual development. Several ripe or nearly ripe specimens were observed as well as recently spent and early recovered individuals.

Trawl tows were made at each index station but catches were small in all cases. The principal species taken in the trawl were slimy mudlars, nine-spine sticklebacks, smelt, and *L. hoyi*. A $\frac{1}{2}$ -meter plankton net (32 grit cloth) was towed at the surface, 18 feet and 30 feet below the surface in 35 fathoms northeast of Bear Island. Only 1 unidentified fish larva was captured, in the tow 18 feet below the surface.

Surface water temperatures have warmed considerably since the previous cruise, ranging from 56.9° north of Devil's Island to 70.4° F. at Pike's Bay. Bottom temperatures, however, still remained at about 40° F.

Note: Also see *Commercial Fisheries Review*, Aug. 1960 pp. 25-26.



Gulf Exploratory Fishery Program

TRAWL FISHING GEAR STUDIED WITH UNDERWATER CAMERA:

M/V "George M. Bowers" Cruise 28 (July 14-29): Motion picture studies of shrimp trawls while being towed were continued by the U. S. Bureau of Commercial Fisheries research



The Service's exploratory fishing vessel George M. Bowers, vessel George M. Bowers during the first week of a cruise made in the Gulf of Mexico off Panama City, Fla. Motion picture film of the operation of a model experimental fish trawl was made in that area.

Due to heavy algae concentrations on the bottom, only 800 feet of underwater motion pictures were taken of a 40-foot shrimp trawl and 10-foot try net. The algae concentrations

in the trawl resulted in reducing the spread of the doors and on one occasion of tearing the net

After reports were received of ideal conditions for photographing shrimp in the Florida Keys, the vessel proceeded to that area; however, no suitable area with shrimp and favorable clean water conditions was found.

Notes: Also see *Commercial Fisheries Review* August 1960 p. 26.



Market News Service

ADDITION OF EASTERN PACIFIC FISHING INFORMATION TO CALIFORNIA "MONTHLY SUMMARY":

The California Fishery Market News Monthly Summary, published by the U. S. Bureau of Commercial Fisheries is now issued in two parts:

Part I - "Fishery Products Production and Market Data" will continue to provide information on receipts of major California Fisheries at leading ports, packs of major canned products and byproducts, and wholesale prices. This part is issued by the

Page	Page
UNITED STATES GOVERNMENT OF THE UNITED STATES BUREAU OF COMMERCIAL FISHERIES	
CALIFORNIA FISHERY MARKET NEWS MONTHLY SUMMARY	
JULY 1960	
Part I - Fishery Products Production and Market Data*	
California Receipts of the major fisheries (including tuna, swordfish, mackerel, anchovies, and major* fish) at leading port; packs of major canned products; numbers of imports; and wholesale prices for frozen and canned products) with comparative data.	
CONTENTS	
Trends in the California Fisheries, July 1960.....	
1	2
California Commerce Receipts of Tuna and Tunamlike Fish (U.S.-Caught and Imported), Mackerel, and Anchovies.....	
2	3
California State of Canned Tuna, Mackerel, and Anchovies.....	
3	3
California Commerce Receipts of U.S.-Caught (Canned) Tuna & Tunamlike Fish.....	
3	4
California Imports of Fresh and Frozen Tuna & Tunamlike Fish.....	
4	4
Oregon and Washington Receipts (Domestic & Imports) of Fresh and Frozen Tuna and Tunamlike Fish.....	
4	5
California Receipts of Fresh and Frozen Tuna, by Certain Markets.....	
5	5
California Tuna Landings by Fishermen.....	
5	5
Cold Storage Report, California and Arizona.....	
5	5
United States Imports of Fishery Products into California & Arizona.....	
5	5
Imported Fresh Tuna Prices, July 1960.....	
5	15
California Imports of Frozen Tuna (By Country of Origin).....	
15	15
Imported Fresh Fish and Shellfish Prices.....	
15	15
Frozen Mackerel During Prices.....	
15	15
Sea-Vessel Prices for Canned Fish.....	
15	15
California Canned Fish Prices.....	
15	15
Imported Canned Tuna Prices.....	
15	15
California Commerce Receipts & Production of Miscellaneous Fishery Products.....	
15	15
Market Fish Descriptions, San Pedro, Santa Monica, and Harbor Areas.....	
15	15

BUREAU OF COMMERCIAL FISHERIES
MARKET NEWS SERVICE
PORT OFFICE BUILDING
SAN FRANCISCO, CALIFORNIA

* Part II - "Fishing Information", containing new catches temperature charts, etc., is published and released from the Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6224 Pt. 100 Station, San Diego 4, California.

Bureau's Fishery Market News Service at San Pedro. (Requests for this part should be made to the Market News Service, U. S. Bureau of Commercial Fisheries, Post Office Building, San Pedro, Calif.)

Part II - "Fishing Information" (the first issue of which was issued in July 1960) includes monthly sea-surface temperature charts for the eastern Pacific, and fishing and research information of interest to the tuna fishing industry and marine scientists. Part II is released by the Bureau's San Diego Biological Laboratory. (Requests for this part should be made to U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF COMMERCIAL FISHERIES	
CALIFORNIA FISHERY MARKET NEWS MONTHLY SUMMARY	
JULY 1960	
PART II - FISHING INFORMATION	
Sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists	
CONTENTS	
Addition of Part II to "California Fishery Market News Monthly Summary".....	Page 3
Topographic Charts of the Eastern Pacific.....	4
Sea-surface Temperature Charts, Eastern Pacific Ocean July 1960.....	5
Bureau of Commercial Fisheries Biological Laboratory P.O. Box 6121, Pt. Loma Station San Diego 6, California	

The Bureau established the San Diego Biological Laboratory in 1959 as its center for scientific studies concerned with tuna of the eastern Pacific. Its prime purpose is to provide for the specific application of oceanographic and biological findings to the problems of the West Coast tuna fishing industry. The laboratory is concerned alike with tropical tunas, albacore, and bluefin. This pub-

lication will be the principal medium used to disseminate information to the industry.

The monthly publication will routinely include sea-surface temperature charts. It will not always contain research and fishing information. Such will be included when there is something of significance to report.

The temperature charts cover that area of the Pacific from the Aleutians in the north to Peru and Chile in the south and offshore to 180° W. longitude. They show for each month the average sea-surface temperature and the deviations from the 30-year average and from the previous year. Between May and November, single-page supplements are issued twice monthly to show, for the immediate region off the West Coast (25° to 52° N. and offshore to 135° W.), the average sea-surface temperature for the first and last 15 days of the month. Research and fishing information indicates that the distribution of tunas and many other commercial species is directly affected by sea-surface temperatures. The charts are being prepared promptly and are expected to be most useful to fishermen in their operations. They will also benefit research scientists and meteorologists studying the oceanic environment of the eastern Pacific.

The one-page supplements will be of interest primarily to fishermen operating along the United States west coast, particularly albacore fishermen, and research agencies concerned with the coastal environment.



Maryland

BIOLOGICAL LABORATORY RECEIVES GRANT FOR RESEARCH ON EARLY LIFE HISTORY OF FISH:

Maryland's Chesapeake Biological Laboratory has received a National Science Foundation grant of \$34,700 for work on the early life stages of fish in the Chesapeake Bay and Middle Atlantic Ocean areas.

The Director of the Maryland Department of Research and Education reported on August 17 that the grant had been made for a project directed by the senior fisheries scientist at the Laboratory.

The project, to run three years, is divided into two phases. The first consists of field and laboratory work in identifying and illus-

trating the eggs, larvae, and young of various species of fishes, many of which cannot now be completely identified. The work will make it possible to locate the spawning areas of Chesapeake Bay fishes, assess their spawning survival, and determine what natural factors affect the different stages of development. When identification is definitely established, the results will be published for the benefit of other workers.

"The period shortly after eggs hatch is greatly affected by such natural conditions as temperature, salinity, and food supply. Extremes of these factors may decide whether a hatch will provide a good harvest or a poor one several years later when the fishes reach keeper size," the scientist pointed out. "Yet, we know very little about this period."

As a second phase, an atlas of drawings of fish eggs and young of those species found in the region will be compiled from published and original sources. This will be printed in a book to serve as a research tool for the identification purposes, to show where gaps of knowledge are found, and to stimulate further work in this important field. This information, unfortunately, is now scattered in many different locations and is unavailable to most individual workers.

The project proposal, which won the approval of the Foundation, noted that "Russia probably has the largest, most intensive program dealing with basic and applied studies on all phases of the biology and ecology of early fish development. Japan, India, and Italy are also much further ahead of the United States in such valuable and much-needed research." All of these countries regard their fisheries of prime importance to their economy.

The Maryland Laboratory project will go far toward plugging holes in the knowledge of younger forms, at least in this part of the nation.

The scientist and his assistants were the first to rear striped bass successfully in 1955 from the egg to the young fish, a report of which was published in 1958.

In the new activity, the scientist will be assisted by a scientific illustrator and a full-time biologist under terms of the grant. In addition, the Laboratory will provide considerable aid with other personnel and equipment.



North Atlantic Fisheries Exploration and Gear Research

ANNUAL OVERHAUL OF FISHERIES RESEARCH VESSEL "DELAWARE" HELD UP BY FREAK ACCIDENT:

The U. S. Bureau of Commercial Fisheries research vessel Delaware is stranded half way up a marine railway in New London, Conn., where she was being dry-docked for annual overhaul and for the installation of a new underwater searching device on her hull. The 147-foot vessel was stuck by the derailment of the cradle that hauls large vessels out of the water. Her predicament is challenging marine engineers and salvage experts.

The Delaware's overhaul schedule called for the installation of a new device for locating and tracking schools of fish and to spot the presence of underwater obstacles such as sandbars, shoals, sunken wrecks, etc.



Oceanography

CHARTS OF EASTERN PACIFIC OCEAN FLOOR:

Detailed maps of the ocean floor from southern California to northern Chile and several hundred miles seaward are being compiled for the benefit of the tuna fleet by the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, and the University of California's Institute of Marine Resources.

The maps are based upon millions of echosoundings made in the region by research vessels, mostly during the past 10 years. Much of the data have not been generally available. The topographic charts will be useful in locating tuna and also for navigation.

Frequently tuna are found in greater abundance around seamounts and deeper protuberances rising above the sea floor than in the surrounding waters. The accidental discovery of Shlimada bank, off the west coast of Mexico ($16^{\circ} 52' N.$, $117^{\circ} 31' W.$), and the ensuing large catches of yellowfin tuna was largely responsible for the initiation of the project to analyze and plot the large amount of sounding data collected during the past decade by research vessels of Scripps Institution of Oceanography and other agencies.

A series of 24 charts covering the area from 35° N. latitude (just north of Pt. Arguello) to 24° S., and 600 to 700 miles offshore will be issued. Two charts (Nos. 1 and 3) have been distributed and the remainder will be issued on the average of once each month until completion of the series. The charts issued cover an area from the coast offshore to 12° W. longitude between 23° and 35° N. latitude. It will be determined whether there are sufficient new sounding data to warrant preparation of charts between Pt. Arguello and the Columbia River.

* * * * *

SURVEY OF PACIFIC OCEAN AREA OFF SAN FRANCISCO UNDER WAY:

The familiar parachute--which has for so many years used air currents to lower objects safely through the atmosphere--will take to the water to aid oceanographers in observing ocean currents in a new project announced by the Coast and Geodetic Survey, U. S. Department of Commerce, on July 31, 1960.

In mid-August the Coast and Geodetic Survey ship Pioneer was scheduled to explore an 8,000 square-mile section of ocean northwest of San Francisco. The project blends hydrographic and oceanographic activities into one operation.

Deep-sea soundings will be recorded while a study is made of bottom sediments, sea water temperatures, salinities, magnetic disturbances, and meandering coastal currents.

The parachutes--which are being used by the Survey on a large scale for the first time and have been used by other oceanographic scientists before--will be submerged in several areas about 50 miles offshore. Suspended at depths of approximately 16 and 1,000 feet, the big 'chutes are secured by line to surface floats and allowed to drift with

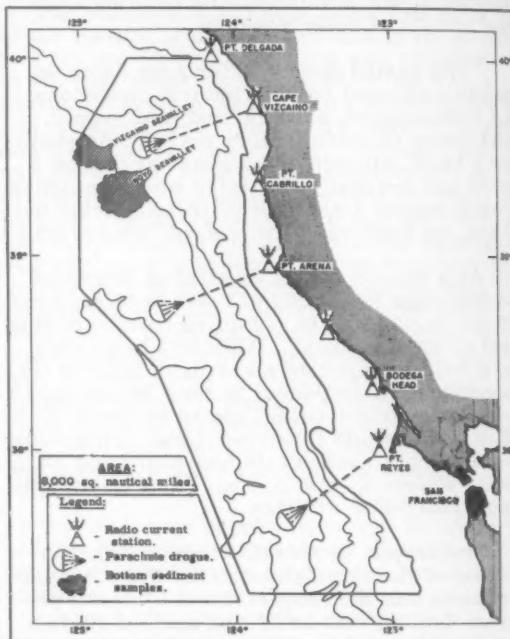


Fig. 1 - Area of oceanographic survey, season 1960 by the U. S. Coast and Geodetic Survey ship Pioneer.



Fig. 2 - The U. S. Coast and Geodetic Survey ship Pioneer.

the current. Careful tracking of the floats for a period of 48 hours will provide significant data on direction and speed of deep submarine currents.

In addition, radio current meters also will be suspended 15 feet below the surface from bright yellow buoys anchored near Pt. Reyes, Bodega Head (Calif.), Salt Point, Point Arena, Point Cabrillo, Cape Vizcaino, and Point Delgada. Information will be transmitted from the buoys to a ship recorder by radio signals.

One of the problems the Marine scientists want to solve is the varying characteristics of the coastal currents. There is a current flowing southward and parallel to the Pacific Coast with a velocity which averages about $\frac{1}{4}$ nautical mile per hour. Prevailing winds, upwelling, and other physical forces can greatly alter this flow in many areas. The Pioneer will concentrate on probing in an area between Point Reyes and Point Delgada and within 60 miles of shore.

The ship will make detailed investigations near the mouths of the Vizcaino and Noyo sea-valleys. Located about 50 miles offshore and in 7,800 feet of water, these sea-valleys are great submarine "channels" carrying vast quantities of sediment out to sea. Sediment samples will be brought to the surface and analyzed. They may give indication as to what processes are taking place along the ocean floor.

The 311-foot Pioneer is one of the largest ships in the Coast and Geodetic Survey fleet. This reassignment follows 5 years of special oceanic surveys for the U. S. Navy. Upon arrival at San Francisco on July 26, 1960, the ship terminated a 5,000-mile trackline across the Pacific Ocean from Kwajalein Atoll in the Marshall Islands to Point Buchon in California. The resulting profile of the peaks and deeps of the ocean bottom took the ship by way of Wake Island, Midway, and Oahu. Thirteen Coast and Geodetic Survey officers are assigned to the big ship.

The ocean survey near San Francisco may provide science with important new knowledge of our marginal seas. Coastal currents affect the fishing industry of California and have an influence on the weather and climate in the area.



Oysters

MORTALITIES IN CHESAPEAKE AND DELAWARE BAYS:

Disastrous mortalities have virtually wiped out the oyster industry in Delaware Bay and some nearby waters since 1957. Serious losses, although not as destructive, have also damaged the industry in the Chincoteague Bay area. Most recently, very heavy death rates are threatening large areas of Chesapeake Bay. In a paper presented at the Fifty-Second Joint Annual Convention of the Oyster Growers and Dealers Association of North America, Inc., with the National Shellfisheries Association and the Oyster Institute of North America, Baltimore, Md., July 31-August 3, 1960, the President of the National Shellfisheries Association summarized the status of oyster mortalities. The paper presented what is now known about the oyster mortalities:

- (1) A parasite of oysters, called "MSX," is present in many sick, dying, and dead oysters, and is now considered to be a major cause of deaths in Delaware and perhaps in lower Chesapeake Bay and Chincoteague Bay.
- (2) "MSX" apparently is not a fungus.
- (3) The complete life cycle is not yet known.
- (4) Even in the areas of heaviest kill, a small percentage has survived. These will be of special importance for the future.
- (5) The presence of "MSX" and other microparasites can be detected only by careful laboratory methods.
- (6) Deaths can occur within one or two months after oysters are exposed, and can spread rapidly. We do not know the method of transmission from oyster to oyster.
- (7) Deaths have been greater in high salinity areas than in low salinities, but no sharp dividing line is known. We do not know the effects of moving infected oysters into fresher waters.
- (8) The heaviest losses have involved "MSX" and other factors, for example *Dermocystidium*, at the same time. One parasite or unfavorable condition may make oysters more susceptible to another. The sequence is complex.
- (9) In Delaware Bay, spring-planted seed has high death rates in late summer. Summer and fall seed shows heavy loss the following spring. Some loss occurs throughout the year.
- (10) Oysters imported into Delaware Bay from many sources have all shown susceptibility. Best survival there has been by local seed from parents which lived through one or more years of exposure.
- (11) In Chincoteague Bay and the seaside area, losses have been low among oysters held for a few months, but have increased in all oysters held for a second year. Total losses have not been as heavy as in Delaware Bay.
- (12) *Dermocystidium*, drill loss, low oxygen, and other causes of death in various areas are still a major part of the picture and must not be overlooked.
- (13) Seaside oysters contain a micro-organism which may be a stage of "MSX" or a different parasite.

The paper then summarized future prospects as follows:

Scientists are extremely reluctant to make predictions and general statements when evidence is incomplete. This is wise and proper. At the same time, state management agencies and members of the industry are entitled to know the present thinking of biologists. They urgently need the

strongest possible basis for important decisions which cannot be deferred. If these users are willing to recognize clearly that ideas must change as new facts emerge, the research biologists are willing to try to estimate some of the future developments in the mortality problems.

- (1) Only natural control offers promise. It is probably impossible to control microparasites by chemicals or other artificial means.
- (2) Thorough basic study is essential for understanding of the parasite or parasites and methods of combating it.
- (3) Parasites will spread by natural means and by accidental transportation, and they will reach most of the areas where conditions permit them to survive. They may not yet have reached full spread.
- (4) If the Chesapeake follows the Delaware patterns, (a) the mortality will continue to spread to new areas. The rate of spread might be rapid. (b) High salinity areas will probably have heaviest losses. Note, however, that the seaside area has shown a distinctly different pattern.
- (5) Dense oyster populations are more likely to have serious mortalities than are scattered ones.
- (6) Transplants into areas of high mortality are probably futile and may be destructive to oysters already present.
- (7) Transplanting from infected areas is likely to speed up spread of the parasite.
- (8) Possibilities of spread north and south are not predictable.
- (9) Some constructive measures are possible. These include: (a) control of import and export of shells, seed, and oysters; (b) perhaps use of low salinity waters to protect stocks; (c) planting and harvesting at the most advantageous time; (d) protection of brood stock in unaffected areas from excessive depletion; and (e) maximum development of stocks in affected areas. Research and practical experience may reveal other techniques.
- (10) Selection and development of resistant stocks is probably the only way to achieve recovery in areas of high mortality. This can be greatly assisted by careful management based on sound research. It is, however, slow and expensive.

* * * * *

MSX OYSTER KILLER IDENTIFIED AS ANIMAL PARASITE:

MSX, the suspected killer of oysters which has decimated beds in Delaware Bay and some areas in Virginia, and which poses a threat to Maryland, is now tentatively identified as an animal parasite, the Maryland Chesapeake Biological Laboratory at Solomons announced on August 24, 1960. MSX previously had not been placed definitely in either the plant or animal kingdom. This statement was made after examination of hundreds of slides from infected oysters by two parasitologists. Their work at the Laboratory is part of Maryland's contribution in an all-out cooperative effort to learn as much as possible about the parasite.

One of the parasitologists has found that MSX cannot be identified as one of the plant-like pathogens and does not have the characteristics of any known plant-like organism. By elimination, this places the organism as an animal parasite, and the matter of identification a problem for animal parasitologists.

The term MSX is scientific shorthand for "Multinucleate Sphere X." When the name was coined some time ago at Rutgers University, all that was known about the suspected oyster killer was that it was spherical, had several nuclei, and could be seen only through a microscope. Little else was known about its identity--hence the "X" factor. About 5,000 of the tiny spheres lined up in a row would extend about one inch. However, one further thing is certain: MSX is not harmful to humans--only to oysters.

A staff member who recently joined the Chesapeake Biological Laboratory is especially interested in the Sporozoa, a group of minute animal parasites to which it is now thought MSX may belong. He cautioned that much more must be learned about the identity of the organism, and that little is known about how MSX operates as the suspected killer of oysters. Certain information is on hand, however, to show how similar animal parasites cause harm to their hosts.

Teams of scientists at Rutgers University, the Virginia Fisheries Laboratory, the U. S. Bureau of Commercial Fisheries in Annapolis, and the University of Delaware have for some time been making a vigorous attack on the problem relating to MSX.

The Chesapeake Biological Laboratory has instituted a similar research program, conducted in cooperation with the other institutions. This combined approach is the largest ever mounted against a threat to coastal shellfish.

The Laboratory's shellfish program is attacking a number of other phases of the MSX problem. Fourteen outposts have been established in the Maryland Chesapeake area and in the Chincoteague area where oyster bars and test trays provide oysters which are examined under microscopes. These will give warning in case MSX advances northward from Virginia.

The assembled scientific talent, though concentrating on MSX, is taking advantage of the opportunity to study more fully other oyster predators such as mud worms, oyster drills, crabs, *Dermocystidium* (a fungus which functions similarly though not so devastatingly as MSX), and the so-called SSO (Seaside Organism) found in Virginia. SSO may, it is felt, be simply one stage in the life cycle of MSX.

Steps in combating a harmful organism about which little is known were described by the Laboratory Director as follows:

"First, the killer must be identified. Its life cycle must be learned--its appearance in various stages of development, how it is transmitted from one oyster to another, how it spends the winter. Perhaps we can interrupt the life cycle at some point--or perhaps not.

"Failure to interrupt the life cycle would leave us dependent upon the locating and encouraging of the few survivors, the mortality-resistant oysters. In any kind of living organism there are nearly always certain individuals which, like the flies that resist DDT and the human bacteria that resist penicillin, can form the nucleus of a new population.

"While our research in Maryland will be of value elsewhere, we are still hopeful that it won't be needed here. We are fortunate in that MSX appears to prefer saltier waters; however, it may adapt to the upper Chesapeake Bay's fresher water in time. We are therefore bound to learn all we can as soon as we can. We must maintain constant watch."

* * * * *

MARYLAND OBSERVATIONS, 1960 SEASON:

Maryland oyster setting this season has been later than usual and has been sparse, according to the July 27, 1960, Special Oyster Bulletin of the Maryland Chesapeake Biological Laboratory. Salinity during late

spring and early summer averaged about 20 percent less than normal. Temperatures were much lower than normal in early spring but were near the normal during early summer. Temperature and salinity of the water in the Holland Straits area for the first three weeks in July averaged about 79° F. and 12.7 o/oo, respectively.

The continued high oyster mortalities in Delaware Bay and in certain portions of the lower Chesapeake are of major concern.

At the tray stations and during a spring survey, oysters appeared to be normal in the Maryland portions of the Chesapeake except for some losses at Cinder Hill where a number of known adverse causes affected survival. The organism termed "MSX," that is associated with Delaware Bay mortalities, has not yet been found in Maryland Chesapeake Bay oysters although it has been found on the seaside. However, preparation and examination of material for detection of this parasite are very time-consuming and a large backlog of collections remains that has not yet been checked.

The Virginia Department of Tidewater Fisheries, the Maryland Department of Research and Education, and the U. S. Bureau of Commercial Fisheries cooperate in making counts of commercial oyster set in the fall and succeeding months in the Chesapeake Bay area.

Maryland oyster setting has remained light at most stations where observations are made, according to the August 19, 1960, Special Oyster Bulletin.

Water temperatures probably reached their peak (79° to 86.5° F. during the first three weeks in August) and salinities remained lower than normal.

The combination of high temperature and copious rainfall caused a strong stratification of the water with oxygen-poor (stagnant) water conditions in deep water reaching up nearer to the surface than normal.

Steady winds crossways of the Bay can cause the pool of stagnant water to tilt over towards either side of the Bay. When it overlies oyster beds for a sufficiently long period it may cause anaerobic conditions to develop at the bottom, accompanied by the generation of hydrogen sulphide, a gas smelling like rotten eggs. This gas is poisonous

and adds further to bad environmental conditions that may kill oysters, crabs confined in pots, and bottom-feeding fish. Heavy blooms of certain minute organisms sometimes cause patches of discolored water or "red tides" that add to the unfavorable conditions. No reports of damage have been made this season and it is probable that better mixing soon will restore oxygen levels to normal.

Heavy mats of a foreign species of seaweed, a water milfoil, are causing an increasing problem to oyster growers in certain tributaries of the Potomac. This problem is expected to increase with spread of the pest.

Oysters held on trays have shown no unusual mortality thus far except in Holland Straits, where oyster losses have continued higher than at other stations. Preparation and examination of material to determine the presence of "MSX," the parasite associated with the Delaware Bay mortalities, are in progress and are being rapidly stepped up as new equipment has been put into use.

The fungus parasite, Dermocystidium, has shown a rather high incidence on Cinder Hill during the past few weeks and undoubtedly is causing some of the oyster mortality observed there.

* * * * *

VIRGINIA'S YIELD PER ACRE ALMOST TREBLE THAT FOR MARYLAND:

At the August meeting of shellfish scientists and oyster growers in Baltimore, Md., a speaker from Crisfield, Md., stated that the Japanese are harvesting 80,000 pounds of oysters per water acre as compared to 50 pounds per acre in Maryland.

In contrast to the very low yield per acre in Maryland, the Information Officer for the Virginia Fisheries Laboratory points out that production on leased and planted oyster bottoms in Virginia is usually much higher than the estimates for Maryland. According to statistics compiled by the U. S. Bureau of Commercial Fisheries, the average production in Virginia for oyster planters is about 163 pounds per acre. This does not take into account the many acres of oyster grounds leased, but not cultivated. If the actual amount of uncultivated grounds were known, Virginia oyster production would probably be shown much higher.

Approximately 128,216 acres of oyster grounds are rented to oyster farmers in Virginia. Although these oyster-growing bottoms are admittedly inferior to the public rocks and might be compared to submarginal farm land, they produce nearly five times as many oysters as are harvested from the 200,000 acres of public grounds.

Research conducted by the Virginia Fisheries Laboratory has benefited planters in helping them make the best use of the ground they rent. The Laboratory has prepared for distribution a booklet, Let's Be Oyster Farmers, to make information available to oyster farmers throughout Virginia.

* * * * *

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

As of August 10, 1960: Since the latter part of July, the bottom water temperature has increased several degrees in Long Island Sound and now ranges between 70.5° F. and 73.0° F. Examination of U. S. Bureau of Commercial Fisheries plankton samples, each retaining material screened from 200 gallons of water, again showed that oyster larvae are extremely uncommon. No mature oyster larvae were found in the Milford and New Haven areas from August 1 through August 8. In the Bridgeport area, one mature oyster larva was found on August 4, and three larvae were observed on August 8. The latter sample also included a large number of larvae of the wood-boring bivalve, Teredo, a condition indicating that the water mass probably came from the Housatonic River.

The absence, or near absence, of bivalve larvae, in general, and especially oyster larvae, is correlated with the plankton blooms that have been apparent in our water this summer, according to the biologists. As mentioned before, these blooms are responsible for large patches of "red water" that are caused by microscopic organisms, most of which belong to three groups, namely, Prorocentrum, Gymnodinium, and Gyrodinium.

Oyster setting continues to be extremely light. Between August 4 and August 8 it occurred only at four stations at the rate of 2 to 3 spat per 20 shells.

Starfish setting continues. However, it has shown a very sharp decrease since July 24. At present it is light and irregular, and

has occurred during the last four days at only approximately half of the Bureau's stations. (Bulletin No. 4, August 10, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

As of August 23, 1960: The bottom water temperature of the oyster-producing section of Long Island Sound remained quite steady during the two weeks preceding August 23, 1960, and, as of that date, it ranged between 71.0° F. and 74.0° F. During the same period the water conditions gradually improved because fewer dinoflagellates that are responsible for "red water" were present. On August 22, no conspicuous patches of "red water" were observed within the entire New Haven-Bridgeport area, where the U. S. Bureau of Commercial Fisheries stations are located.

Parallel with the improvement in the water conditions, the numbers of bivalve larvae, including those of oysters, began to increase. Plankton samples collected about August 15 showed oyster larvae present in all three areas, i.e., New Haven, Milford, and Bridgeport. Although found at all stations, they were present in small numbers and were of different sizes, thus indicating that this was not a large, single brood that would give a heavy setting of short duration but a mixture of many broods that will result in a continuous but light setting.

Bivalve larvae continued to be present in fair numbers on August 22. They were most numerous at one station located at a 30-foot depth in the Bridgeport area, where a total of 23 mature oyster larvae were found in a 200-gallon sample. This is rather a substantial number of old larvae, probably indicating that a considerable increase in the intensity of setting may be expected at least in the Bridgeport area.

Oyster setting continued at most of the stations but remained light, although during the week preceding August 23 its intensity somewhat increased, especially at one station in the New Haven area and one station located in comparatively shallow water on the Bridgeport natural bed. Upon examination of the collectors brought in on August 22 the most promising aspect was that the majority of the recently-set oysters were only a day old or younger. This circumstance also indicated that an increase in intensity of oyster setting should be expected.

Contrary to the increase observed for oyster setting, setting of starfish showed a decline. For example, between August 18 and August 22, the last collecting period, only a single starfish spat was found per 40 shells at two stations, while the collectors from other stations were entirely free of young starfish. (Bulletin No. 5, August 23, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

* * * *

UNDERWATER HARROW MAY AID STARFISH CONTROL ON OYSTER BEDS:

In connection with the development of the underwater harrow by the Milford Biological Laboratory of the U. S. Bureau of Commercial Fisheries as a mechanical method of



Fig. 1 - A type of underwater harrow used as a mechanical method of control of oyster enemies.

control of oyster enemies, experiments are in progress to determine what happens to starfish covered by mud. Three types of substratum were used: mud, shells and mud, and sand. In mud, starfish buried in one inch could not emerge and died in 3 to 4 days at a temperature of about 10° to 12° C. (50°-53.6° F.), and in 2 or 3 days at a somewhat higher temperature. When starfish were covered with mud so that only one or two of their rays protruded in the open, only approximately 20 percent could emerge. The others died.

More or less similar results were observed using shells and mud and sand. In general, however, starfish die faster in mud.



Portion-Control Fishery Products

USE IN INSTITUTIONAL AND PUBLIC EATING PLACES:

Use of portion-controlled fish products by institutional and public eating places is definitely increasing. This was one of the findings of a survey conducted in ten selected cities by Crossley, S-D Surveys, Inc., for the U. S. Bureau of Commercial Fisheries to determine how much frozen fish, shellfish, and portions were purchased and served in restaurants and institutions.

In each of the ten cities surveyed, more than 10 percent of establishments using portions reported greater purchases of portions compared to the previous year. More than half of the purchasers in Springfield, Mass., said they were buying more. In Denver 47 percent of the users reported buying more.

"Convenience and ease of preparation" of portions was the most often cited advantage over other types of frozen processed fish. User establishments ranked "convenience" first in six of the 10 cities and second in the other four. "Uniformity and size" of portion held first place in three cities--Atlanta, Cleveland, and New York City; "fast and time-saving features" were most often cited by Los Angeles eating places.

Cost of using portions, as compared to other frozen processed fish, was considered less expensive or about the same by a wide majority of establishments in all cities except Springfield. About 51 percent of the Springfield users said they were more expensive compared with the 22 percent reporting them to be less expensive. In four cities--Chicago, Cleveland, Houston and Omaha--90 percent of the establishments using portions considered them no more expensive than other forms of frozen processed fish.

Omaha ranked first among the ten cities in terms of percentage of all establishments buying frozen processed seafood. Atlanta was second and New York City was last. Omaha and Atlanta also ranked at the top by percentage of establishments purchasing portion-controlled fish products, with 27 percent of users in each city buying portions.

Frying was the leading method of preparing all types of frozen processed fish prod-

ucts in the ten survey cities. It was also the leading method for preparing portions in all of the cities except Springfield, where baking was more popular.

In all cities, a majority of establishments using portions cooked them while frozen. This ranged from highs of 59 percent in Chicago to 92 percent in Omaha. Breaded portions were the most popular portion items.



Uncooked-breaded portions were the leading type of portion-controlled fish product in 8 of the 10 cities in terms of the percentage of establishments using them. The two exceptions were New York City and Springfield, where portions were most frequently bought cooked-breaded.

Uncooked-plain portions ranked high in Chicago and Cleveland and the quantity purchased was greater than that of any other type. Quality of portions was generally considered satisfactory by nearly all establishments in all cities.

There were a variety of disadvantages to using portions cited by users in each city, although a majority specified no disadvantage.

The size of portions in a package was considered satisfactory by almost all establishments in the 10 cities.

The majority of the portion users said they specified the kind of fish when ordering portions. A very small percentage of the portion users suggested new portion items, not available, which they would like to have.



North Atlantic Fishery Investigations

UNDERWATER TELEVISION AIDS BIOLOGISTS IN FISH BEHAVIOR STUDIES:

Biologists at the U. S. Bureau of Commercial Fisheries' Woods Hole Biological Laboratory now are able to extend their studies with the help of underwater television

to include observations of fish as they are caught in otter trawls. The specially-designed television camera is suspended within the cod end of the trawl and the image transmitted



over a coaxial cable to a receiver on board the vessel. Continuous observations or motion-picture recordings of the fish in the submerged net can be made by biologists in the comparative comfort of a shipboard laboratory.

A major problem in large mesh or savings-gear studies has been the behavior of fish in the trawl. The questions raised by the biologists are (1) do the small haddock or other commercially valuable species actually try to escape through the meshes; or (2) do non-commercial varieties clog the meshes, thus blocking the escape of immature food fish. Underwater television will now help to supply answers to these and other questions.

Careful analysis of motion picture recordings of the television screen has uncovered some interesting facets of species differences in behavior. For example, haddock seem to explore the confined area within the cod end, crossing from one side of the trawl to the other. In contrast, sand lance, an important marine forage species, seem in a hurry to escape through the meshes and usually do so in very rapid fashion.

Many future underwater television studies are planned by the Laboratory. One such study will examine the relationship between the swimming ability of fishes and the speed of the trawl moving over the ocean floor.



South Atlantic

Exploratory Fishery Program

SAVANNAH RIVER-CAPE HATTERAS OFFSHORE AREAS SURVEYED FOR FISH AND SHELLFISH RESOURCES:

M/V "Silver Bay" (Cruise 25)! The offshore area (5-100 fathoms) from the Savannah Riv-

er, Ga., to Cape Hatteras, N. C., was surveyed for stocks of clams, scallops, shrimp, and fish by the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Silver Bay, July 13-30, 1960.

In 29 drags with a 14-tooth Fall River clam dredge, scattered individual live clams (*Venus mercenaria*) and dead shells were taken in the vicinity of Bogue Inlet and Cape Fear. No live shells were taken in the vicinity of Cape Romain.



M/V Silver Bay Cruise 25 (July 13-30, 1960).

A total of 18 drags with an 8-foot modified Georges Bank scallop dredge, with a $1\frac{1}{2}$ -inch mesh liner (to determine the seasonal availability of calico scallops in known areas), east of Core Banks, produced catches up to 19 bushels per half-hour drag. The best catches were made in the 20- to 21-fathom depth range. The scallops were large (about 2.4 inches average), but the yield per bushel was only $2\frac{1}{2}$ pints as compared with about 5 pints in September.

Inside the 10-fathom curve, 27 drags produced only scattered individual brown shrimp, *Penaeus aztecus*, and pink shrimp, *Penaeus duorarum*, except for one 40-pound catch of 26 to 30-count per pound headless brown shrimp in a one-hour drag.

Surface trolling at intervals between trawling stations resulted in the capture of king mackerel (*Scomberomorus cavalla*), dolphin, (*Coryphaena hippurus*), and white skipjack (*Katsuwonus pelamis*).



Telephone and Telegraph Cables

CHARTS SHOW CABLES IN NORTHWEST ATLANTIC:

Charts showing the exact routes of telephone and telegraph cables in the Northwest Atlantic Ocean area are now being made available for the first time to fishermen.

The cable companies hope the release of the detailed charts will help to prevent trawling damage to the cables--the mainstay of telephone and telegraph communications between North America and Europe.



Tuna

COMPOSITION STUDIES:

Research on the composition of tuna has been under way in the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries for more than a year. It has been determined that compared to some other salt-water species of fish, the tuna and tuna-like fish are low in moisture and sodium, and high in protein. Oil content is variable, ranging from 1-15 percent. The study involves the collection of two series of 10 fish each, taken each season over a period of three years. Samples are prepared from the light and dark meat of nape, center, and tail steak sections taken from each fish.

The investigation of albacore tuna is in its second year, skipjack tuna in the first year. Exploratory composition work has also been done on both bluefin and yellowfin tuna.

* * * * *

TROLLING PROGRAM AIDS

PACIFIC COAST ALBACORE FLEET:

The cooperative program arranged by the U. S. Bureau of Commercial Fisheries and the U. S. Navy at the five picket stations along the West Coast, whereby trolling gear was fished almost daily from the vessels occupying those stations, proved effective in helping to locate the first incoming albacore tuna schools this season and in relaying the information to the United States albacore fleet. When catches were heavy or large schools were sighted, the Bureau was notified

by a radio message through Fleet Weather Facility, San Diego.

In addition to the Navy trolling program, the Bureau's research vessel Black Douglas of the La Jolla Biological Laboratory and research vessels of the Scripps Institution of Oceanography undertook a similar trolling program while on marine life research cruises. Invaluable information was obtained regarding the early season distribution of albacore this year.

Albacore fishermen's groups were alerted continually concerning catch and distribution information received as a result of the trolling program.



United States Fishing Fleet^{1/} Additions

During June 1960, 68 vessels of 5 net tons and over were issued first documents as fishing craft--a decline of 19 vessels as compared with the same month of last year. The

Area	June		Jan.-June		Total 1959
	1960	1959	1960	1959	
(Number)					
New England	6	1	12	8	15
Middle Atlantic	1	2	9	5	12
Chesapeake	15	11	38	45	106
South Atlantic	7	13	27	44	76
Gulf	16	25	43	76	135
Pacific	20	20	71	59	97
Great Lakes	3	2	7	5	6
Alaska	-	13	14	20	32
Total	68	87	221	262	479

Note: Vessels assigned to the various areas on the basis of their home ports.

Pacific led with 20 vessels, followed by the Gulf with 16, and the Chesapeake with 15. The South Atlantic, New England, Great Lakes, and the Middle Atlantic areas represented the remaining 17 vessels.

During the first six months of 1960, a total of 221 vessels were issued first documents as fishing craft--41 less than were reported dur-

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft By Tonnage, June 1960

Net Tons	Number
5 to 9	42
10 to 19	13
20 to 29	6
30 to 39	1
40 to 49	2
100 to 109	1
130 to 139	1
230 to 239	1
270 to 279	1
Total	68

ing the same period of 1959. Most of the decline occurred in the Gulf area where 33 fewer vessels were documented in the first six months of 1960 as compared with the same period of 1959.

^{1/}Includes both commercial and sport fishing craft.



U. S. Fish Meal and Solubles Production and Imports, January-June 1960

During the first six months of 1960, the United States production of fish meal amounted to 74,024 tons, compared with 92,471 tons for the same period in 1959. An even greater decline occurred in imports, from 100,701 tons for the first half of 1959 to 66,375 tons for the first half of 1960.

Similar declines occurred in the production and imports of fish solubles. The January-June 1960 production of 33,722 tons of solubles was 25,166 tons less than for the

Item	January-June		Total 1959
	1960	1959	
(Tons)			
Fish Meal:			
<u>Domestic production:</u>			
Menhaden	54,370	69,945	223,893
Tuna & mackerel	11,520	10,528	25,380
Other	8,134	11,998	57,278
Total production	1/74,024	1/92,471	306,551
Imports:			
<u>Canada</u>	21,930	30,099	39,033
<u>Peru</u>	32,889	36,884	49,923
<u>Chile</u>	7,393	4,995	5,104
<u>Angola</u>	-	20,738	20,738
<u>Union of So. Africa</u>	3,905	2,422	9,727
Other countries	258	5,563	8,400
Total imports	66,375	100,701	132,925
Available fish meal supply	140,399	193,172	439,476
Fish Solubles (wet weight):			
<u>Domestic production</u> ^{2/}	33,722	58,888	165,359
Imports:			
<u>Canada</u>	615	966	1,660
<u>Denmark</u>	1,858	8,547	18,723
Other countries	45	312	6,247
Total imports	2,518	9,825	26,630
Available fish solubles supply	36,240	68,713	191,989

^{1/}Based on reports from firms which accounted for 92 percent of the 1959 production.

^{2/}Includes production of homogenized-condensed fish.

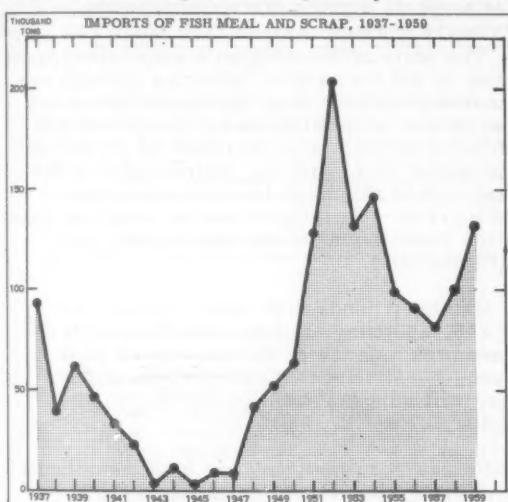
same period the previous year. Imports of solubles the first half of 1960 amounted to 2,518 tons, compared with 9,825 tons for the first half of 1959.



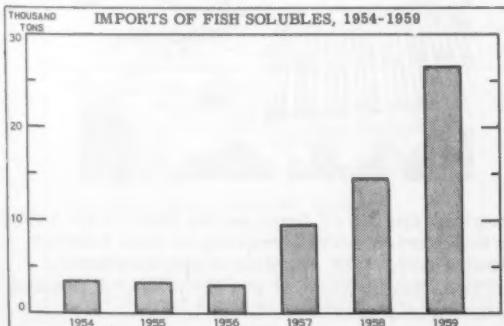
U. S. Foreign Trade

IMPORTS OF FISH MEAL AND SCRAP, 1959:

Total imports of fish meal and scrap entering into the United States during 1959 amounted to 132,925 short tons, valued at \$15.9 million--an increase of 32 percent in quantity over 1958.



Fish meal and scrap imported into the United States from Peru during 1959 led in volume with 49,923 tons. Canada was second with 39,033 tons, followed by Angola with 20,738 tons. Those countries provided 83 percent of total United States imports.



The year 1952 was a record year both in volume and value when 203,539 tons of fish meal and scrap, valued at \$24.3 million, were imported into the United States. In that year Norway led all other countries in meal and scrap shipped to the United States with a total of 50,181 tons. Canada was second with 40,152 tons, followed by the Union of South Africa with 37,523 tons.

United States imports of fish solubles in 1959 amounted to 26,630 tons, valued at \$2.2 million. Compared with 1958 this was an increase of 12,063 tons and \$900,800.

* * * * *

EDIBLE FISHERY PRODUCTS, JUNE 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during June 1960 increased by 5.6 percent in quantity and 5.0 percent in value as compared with May 1960. The increase was due primarily to higher imports of groundfish fillets (up 1.3 million pounds) and fresh and frozen lobster (up 1.4 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine, frozen tuna other than albacore, and fresh and frozen salmon. The increase was partly offset by a 1.6-million-pound decrease in the imports of frozen albacore tuna, and frozen shrimp (down 1.0 million pounds).

Compared with June 1959, the imports in June this year were up by 7.8 percent in quantity and unchanged in value due to higher imports of frozen albacore and other tuna (up 4.0 million pounds), groundfish fillets (up 1.5 million pounds), and fresh and frozen lobster (up 1.1 million pounds). Compensating, in part, for the increases was a drop of about 0.9 million pounds in the imports of fresh and frozen salmon and canned salmon (down 0.6 million pounds).

U. S. Imports of Edible Fishery Products, June 1960
with Comparisons

Item	QUANTITY		VALUE	
	June 1960	Year 1959	June 1960	Year 1959
(Millions of Lbs.) (Millions of \$).				
Imports:				
Fish & shellfish: Fresh, frozen, & processed ^{1/}	86.3	80.1	1,070.5	27.2
Exports:				
Fish and shellfish: Processed only ^{1/} (excluding fresh & frozen)	1.5	4.5	68.0	0.8
				1.3
				22.8

^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in June 1960 were lower by 16.3 percent in quantity and 33.3 percent in value as compared with May 1960. Compared with the same month in 1959, the exports this June were down by 66.3 percent in quantity and 38.5 percent in value. The drop in exports in June this year as compared with the same month in 1959 was due to sharply lower exports of California sardines and squid and miscellaneous fresh and frozen fish to Canada.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the $12\frac{1}{2}$ -percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-July 30, 1960, amounted to 26,754,852 pounds, according to data compiled by the Bureau of Customs. From January-August 1, 1959, a total of 26,535,173 pounds had been imported.

* * * * *

EXPORT EXPANSION PROGRAM AIDED BY EXPORT-IMPORT BANK:

In implementation of the National export Expansion Program, officials of the Export-Import Bank of Washington have provided a description of progress in the operation of medium-term export financing. An innovation in this field was devised by the Bank to give assistance to the United States exporter through flexibility in Bank procedure. Here, the Bank will place sole reliance upon the credit judgment of the participating commercial bank if the commercial bank will finance as much as 10 percent of the invoice value of the sale without recourse on the exporter. The innovation acts as a time saver, since the exporter may deal only with his commercial bank. To date, 43 of these transactions have been approved by the Bank for export sales invoice values of \$5.4 million.

Another point described was the new Export-Import Bank short-term political risk program. In this, the Bank covers short-term transactions which are not in excess of 180 days against non-commercial risks such as inconvertibility of funds, war and civil commotion, cancellation of import license, im-

position of foreign laws, and the expropriation of goods. Services of United States commercial banks and commercial export credit insurance companies have been enlisted by the Bank to act as issuing agents for the guarantees. To date 68 political risk guarantees have been issued under the program for an export volume of \$38 million, and 142 issuing agents have been authorized.



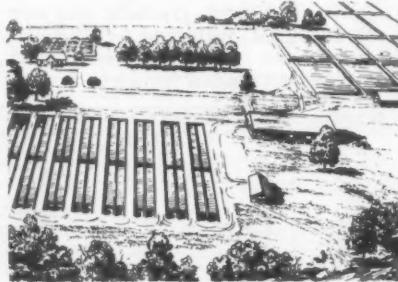
Washington

SALMON PLANTED BY HATCHERIES EXPECT TO SET RECORD IN 1960:

The state of Washington's stepped-up program to aid its salmon fisheries through expansion of salmon rearing in hatcheries and fish farms is showing steady progress, the Director of State's Department of Fisheries announced on August 15. Salmon plants the first half of this year totaled more than 73 million fish--the largest number ever released in the state during a similar period, the Director said.

Hatchery ponds still hold a total of 17,216,112 young salmon, therefore with releases the balance of the year there is a strong possibility that salmon plants this year will surpass the all-time record of 77,491,127 set in 1959.

Releases so far this year have been made in virtually all salmon streams in the State, as well as in a number of fish farms. The great majority of the fish had been reared for



varying lengths of time in the State's 22 salmon hatcheries. This rearing before release results in larger, hardier fish, that have a much better chance of survival than if planted immediately after catching.

Most of the fish-farm plants have been of fingerling-sized salmon, the Director said, reared about 90 days in hatchery ponds. Many of the fish-farm plants have shown phenomenal growth in the predator-free, naturally-enriched areas, resulting in seaward-bound migrants much larger than "wild" salmon migrating to sea.

Of the 73,607,804 young salmon planted so far in 1960, fall chinook was the largest single species, with 50,080,933 fingerlings, 24,768 yearlings, and 4,640,130 fry of that species released. Past experience has shown that plants of fall chinook bring the greatest returns, both in numbers of fish and in poundage, along with being one of the most desired species by both sport and commercial fishermen.

Next largest group was silver salmon, 1,936,907 fingerlings and 8,383,881 yearlings

planted. More than 7 million chum salmon were released--1,036,064 fry and 6,069,566 fingerlings. Pink salmon plants totaled 832,086--8,190 fry and 832,896 fingerlings. Spring chinook plants totaled 603,469--466,500 fingerlings and 136,969 yearlings.

Poundage total for the first six months of this year reached 384,202 pounds, compared to a total of 446,963 pounds of salmon planted during the entire year of 1959.



Wholesale Prices, August 1960

The mid-August 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 124.4 percent of the 1947-49 average was down 4.2 percent from the preceding month, but was higher by 3.8 percent as compared with the same month in 1959. The decrease from July to Au-

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Aug. 1960	July 1960	Aug. 1960	July 1960	June 1960	Aug. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					124.4	129.9	126.5	119.8
Fresh & Frozen Fishery Products:					138.5	147.7	142.0	132.8
Drawn, Dressed, or Whole Finfish:					158.1	165.1	149.7	152.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.14	88.9	136.8	88.3	109.1
Halibut, West, 20/30 lbs., drsd., fresh or froz.	New York	lb.	.36	.34	109.9	106.2	103.7	107.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.88	202.2	198.0	189.3	179.7
Whitefish, L, Superior, drawn, fresh	Chicago	lb.	.64	.63	158.7	156.2	141.3	158.6
Whitefish, L, Erie pound or gill net, rnd., fresh	New York	lb.	.74	.68	149.7	136.6	166.9	161.8
Yellow pike, L, Michigan & Huron, rnd., fresh	New York	lb.	.73	.68	170.0	158.3	155.9	193.5
Processed, Fresh (Fish & Shellfish):					131.6	146.0	144.8	121.5
Fillers, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.27	.46	90.2	154.8	125.9	125.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.68	.79	106.6	124.8	128.8	101.1
Oysters, shucked, standards	Norfolk	gal.	7.00	7.00	173.2	173.2	170.1	148.5
Processed, Frozen (Fish & Shellfish):					112.6	117.8	118.4	112.3
Filets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	100.8	102.1	98.2
Haddock, sml., slids on, 1-lb. pkg.	Boston	lb.	.27	.27	84.8	84.8	78.5	102.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.27	108.7	106.7	110.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.72	.79	111.5	121.5	123.8	106.5
Canned Fishery Products:					104.8	104.8	104.8	102.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	123.9
Tuna, lt. meat, chunk, No. 1/2 tuna (5-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

gust this year was due primarily to sharply lower ex-vessel prices for haddock at Boston and lower fresh and frozen shrimp prices. Prices this August were higher than a year earlier because of higher prices for fresh and frozen halibut, fresh salmon, shucked oysters, fresh and frozen shrimp, and canned fish.



Boxed fish ready for loading and shipping at Fulton Fish Market, New York City. Open box in front is ready to be filled with ice before lid is nailed on.

The wholesale price index for the drawn, dressed, and whole finfish subgroup this August declined 4.2 percent as compared with the preceding month--the sharply lower (down 35.0 percent) mid-August 1960 large haddock prices at Boston were responsible for the drop. All other subgroup items were priced higher. However, the August 1960 subgroup price index was up about 3.9 percent as compared with

the same month in 1959, due to higher fresh salmon prices (up 12.5 percent) and a 1.9-percent increase in fresh halibut prices. Substantially lower prices for fresh large drawn haddock (down 18.5 percent) and fresh-water round whitefish (down 7.5 percent) and yellow pike (down 12.1 percent) at New York City failed to offset the increases.

The fresh processed fish and shellfish subgroup wholesale price index this August declined 9.9 percent from the preceding month. Due to good supplies of small haddock at Boston, the index for fresh small haddock fillets dropped 41.7 percent. This plus a seasonal decline (14.6 percent) in fresh shrimp prices at New York City were responsible for the decline from July to August in this subgroup. From August 1959 to August this year, the subgroup index rose 8.3 percent due to higher (16.6 percent) shucked oyster prices and higher (5.4 percent) fresh shrimp prices. These increases more than offset the sharply lower (down 28.4 percent) prices for fresh small haddock fillets at Boston in mid-August this year.

The wholesale price index for the frozen processed fish and shellfish subgroup dropped 4.4 percent this August from the preceding month. Lower frozen shrimp prices (down 8.2 percent) at Chicago more than offset increases of about 1/2 cent a pound for flounder and ocean perch fillets. Frozen haddock fillet prices were unchanged. From August a year ago to this August, the subgroup price index was almost unchanged (up 0.3 percent). Lower prices for frozen small haddock fillets (down 16.9 percent) were just about balanced out by an increase of 4.7 percent in frozen shrimp prices and a 3.4-percent increase for frozen flounder fillets.

The canned fish subgroup price index in August 1960 remained unchanged from the preceding month and has shown little change over the past 12 months. Prices for all canned fish items (except for Maine sardines) were higher this August as compared with August a year ago. At the end of August 1960, the pack of Maine sardines was trending slightly higher than at the same time in 1959, but the prospects for a fair pack of pink salmon remained very poor. The packing season for California sardines, which opened on August 1 in Central California, started off poorly but picked up some by the end of the month. The major packing season for that species began on September 1 when the Southern California fishing season opened. Raw material for the tuna canning industry remained plentiful with the market, both in the United States and worldwide, somewhat oversupplied.



NOISES MADE BY SHRIMP

Some species of shrimp, notably the snapping shrimp, make very loud noises. These are sufficiently common to cause considerable difficulty to people operating underwater instruments. The commercial shrimp of the species *Penaeus* caught in Gulf of Mexico waters do not appear to make any sounds other than very faint rustling caused by their movements. Attempts have been made to discover some distinctive sounds made by these animals to assist their capture, but without success. The U. S. Bureau of Commercial Fisheries is engaged in further research in this field.



International

BERING SEA

U. S. NAVAL OBSERVATIONS ON SOVIET FISHING FLEETS:

United States Navy planes from Kodiak or Adak, in the Aleutian Chain, Alaska, regularly observe fishing fleets in the Bering Sea while on routine flights. Planes have reported a large number of U.S.S.R. vessels conducting fishing operations in the North Pacific.

All during the winter, the Russian fishing fleets hug the ice pack in the Bering Sea. They have factoryships and reefers (refrigerator ships) coming and leaving the year-round.

There are maybe 4 or 5 motherships, with perhaps ten trawlers each, spaced across the Bering Sea.

Soviet whalers worked both sides of the Aleutians.

FISH OILS

WORLD FISH OIL EXPORTS SET NEW RECORD IN 1959:

World exports of fish oils (including fish-liver oils) reached a record 265,000 short tons in 1959, reflecting resurgent United States exports, record shipments from West Germany, Denmark, and the Union of South Africa, and the emergence of Peru as an important world exporter. Exports in 1959 were one-third above 1958 and were almost double the 1935-39 average.

Following two years of sharply declining exports, shipments of fish oil from the United States in 1959 rose to a new peak of 72,200 tons, exceeding the previous record of 71,300 tons shipped in both 1955 and 1956. United States exports to Europe were up 74 percent from 1958 and accounted for virtually all of those exports. The larger European imports of fish oil stem from an increased demand for all fats and oils following general stock depletion during 1958. Canadian exports were also up sharply in 1959 as a result of a return-to-normal output late in 1958 and throughout most of 1959.

Although several European countries export sizable quantities of fish oil, the area is a net importer--in fact,

the market for a large share of world exports. Most of the oil exported from European countries goes to other countries in the same region.

The record quantities shipped from Denmark and West Germany reflect larger imports for processing and reexporting, since domestic production in both countries changed little from the previous year. Norwegian exports last year were down slightly from 1958. Most of the fish oil included in Norway's share of world exports is fish-liver oil. However, Norway exports around 60,000 tons of hardened marine oils each year. These exports include both fish and whale oil, but are not identified by kind in trade statistics. Thus, Norway's exports of fish oil probably are much larger than indicated.

Peru became an important supplier of fish oil in 1959, and the large volume shipped last year may be exceeded in 1960. Although Peru had facilities to produce large quantities of fish oil prior to 1959, restrictive regulations prevented the industry from any rapid expansion of output. These regulations were relaxed in 1959 and production of fish oil rose to 27,500 tons, an increase of 17,200 tons from 1958. An even larger output is forecast for 1960.

Continent and Country	Fish-Oil (Including Liver-Oil) Exports from Specified Countries and Estimated World Total, Averages 1935-39 and 1950-54, Annual 1956-59					
	1/1959	1/1958	1957	1956	Average 1950-54	Average 1935-39
North America:					 (1,000 Short Tons)
Canada	14.4	5.7	2.7	8.3	11.6	12.0
United States	72.2	47.0	58.5	71.3	42.2	1.2
Total	86.6	52.7	61.2	80.6	53.8	13.2
Europe:					
Denmark	15.6	12.6	9.8	9.7	6.3	2.5
West Germany	31.5	17.9	14.3	9.3	3.0	24.4
Iceland	18.6	27.0	20.9	21.3	19.6	24.5
Netherlands ^{1/}	16.0	13.0	7.1	0.1	14.5	.2
Norway ^{2/}	21.0	22.3	18.6	23.7	30.4	38.0
Portugal	5.6	5.5	4.2	4.7	3.8	.1
United Kingdom	3.7	3.6	3.4	3.8	4.0	6.0
Total	112.1	101.9	78.3	81.6	81.6	75.7
Others:					
Angola	8.8	9.4	13.4	5.7	6.7	.7
Japan	3.6	6.6	3.5	5.0	6.8	35.0
Peru	18.0	1.8	4.8	1.9	.1	-
Union of South Africa	26.2	18.1	11.4	5.4	8.0	2.2
Total	57.5	35.9	33.1	18.0	22.5	37.0
World total ^{3/}	265.0	200.0	180.0	190.0	165.0	135.0

^{1/}Preliminary.

^{2/}Forver temporary.

^{3/}Does not include some whale oil.

^{4/}Does not include sizable quantities of hardened marine oils.

^{5/}Includes estimates for minor exporting countries.

International (Contd.):

A record volume of fish oil was exported from the Union of South Africa in 1959, mainly because of a larger catch of maaibanker and pilchard. To help preserve stocks, an annual quota is imposed on the catch of those fish, and in 1959 the quota was increased to allow fish-meal producers to step up production and compensate for declining world prices. Since fish oil is largely a byproduct of the fish meal industry, oil production also increased. Another factor responsible for the larger output was a planned 25-percent reduction in canned pilchard production, which released further quantities of fish for oil and meal production. Exports probably will be large in 1960 because the higher catch limit again will be in effect. (Foreign Crops and Markets, U. S. Department of Agriculture, June 30, 1960.)

FOOD AND AGRICULTURE ORGANIZATION

FISH FARMING STUDIES IN UGANDA MAY INCREASE YIELD:

The mixed cultivation of tilapia, carp, and Nile perch in fish ponds in Uganda, Africa, has the promise of quadrupling fish production from ponds in that country in a few years, according to an inland fisheries biologist of the Food and Agriculture Organization (FAO), who has just returned from a year's assignment in Uganda. The fisheries biologist said, that the experimental work which he had undertaken during the past year at the Kajansi fish farm, Uganda, showed that the 5,000 ponds in Uganda could support more and other varieties of fish than their current occupants--tilapia.

"Uganda now produces roughly 500 metric tons of fish from her ponds each year," said the biologist. "With a mixed fish population, improved management, the right gear, and fertilization, the yield from the ponds might reach 2,000 tons yearly in 4 or 5 years."

Fish farming began in Uganda in 1953, when the government found that, although Uganda had many lakes, the lack of transportation and processing of fish in the hot African country tended to keep fish out of the diet of Uganda people. Fish could not be found for sale 25 miles north of Lake Victoria--a lake with an area of 26,928 square miles and the world's second largest body of fresh water.

Since fish, a relatively cheap source of animal protein, could not be brought to the people, the Government decided to bring people to the fish, by means of ponds. Tilapia, a small, rapidly multiplying and hardy fish was selected, the ponds were built and then stocked with three varieties of tilapia--Tilapia zillii, T. nilotica, and T. leucosticta.

Farming the fish ponds developed rapidly in Uganda but, as the program went on, it became necessary to obtain more information on scientific fish production and its allied physical and biological research. At the request of the Ugandan Government, the FAO's Fisheries Division supplied technical aid. The FAO biologist began his work at the Kajansi experimental fish farm, aided by British and African fishery officers. A building was outfitted as a laboratory. There, the biologist began to do chemical analyses of the composition of pond water. Once he knew the ingredients of the water, including the amount of algae it contained, he could predict how much fish could be supported under given conditions. In all, he analyzed about 2,000 samples of water.

He then ran through some 500 samples of water containing plankton, to see how much food for the fish was available. Next was analyzing the stomach contents of 300 fish to find out the relation between the food available for the fish, the food eaten, and the food actually digested.

Then came the question of optimum density in a pond--just how many fish the pond could support. Eleven of the fish farm's 30 ponds, ranging in size from $\frac{1}{10}$ of a hectare to two hectares (about $\frac{1}{40}$ to 4.94 acres), were set aside and stocked with the three species of tilapia, and with carp and Nile perch fry of various sizes.

The biologist then turned his attention to the three species of tilapia already inhabiting the ponds. Tilapia nilotica and Tilapia leucosticta live on the ponds' natural production of small aquatic organisms. On the other hand, Tilapia zillii needs to be fed artificially on foods such as elephant grass, sweet potatoes, etc., in addition to the natural resources of the pond.

If the African forgets to feed his fish, then why bother with Tilapia zillii when Tilapia nilotica and Tilapia leucosticta can feed themselves?

"Tilapia nilotica and Tilapia leucosticta now yield only 300 kilos (661 pounds) of fish per hectare (2.471 acres) a year, just using the ponds' natural resources," said the biologist. "However, by feeding these fish, the production could be boosted to 2,000 kilos (4,409 pounds) of fish per hectare per year. Under experimental conditions in small ponds, the production of fish may be extremely high."

International (Contd.):

For example, a maximum of 3,500 kilos (7,716 pounds) of fish per hectare per year has been produced in one small pond. However, such high production can in no way be expected by the average fish farmer of today."

Why were carp and Nile perch selected to be put into the ponds?

"The average carp attains a weight of 1,500 grams (3.3 pounds) in the first year," the biologist stated. "The idea of mixing in carp with the tilapia was first broached in Uganda in 1958, when fingerlings were brought to the fish farm from Israel. Some of these carp now weigh 4,500 grams (9.9 pounds)."

The predatory Nile perch was introduced to the ponds' population of carp and tilapia to keep down the number of small tilapia. The Nile perch, which is also excellent eating, averages about 50 kilos (110 pounds) in lakes when fully grown and has reached a record weight of 175 kilos (386 pounds) in Lake Albert. This gives the ponds a mixed population of the quickly-multiplying tilapia, the rapidly-growing carp, and the Nile perch as a control.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

MORE INFORMATION ON HAMBURG MEETING:

The International Association of Fish Meal Manufacturers met in Hamburg during the second week of June 1960, to discuss future cooperation on scientific research. Participants included delegates from the United Kingdom, West Germany, Norway, South Africa, Spain, Iceland, Portuguese Angola, France, and Belgium. Holland, which is not yet a member, sent an observer. Also an observer from the Food and Agriculture Organization (FAO) and the Federal Research Institute for Fishery in Hamburg took part in the meeting. This meeting established a Scientific Subcommittee to work out chemical and physical examination methods with the view in mind of making it possible to eliminate fish meal of poor quality. Efforts shall be made to have included uniform quality requirements for fish meal in the feed legislation of the member countries.

The delegate of FAO read a paper suggesting a plan of organization to carry out a study of the present and the prospective future trends on the international fish meal

markets. The study shall also deal with the future importance of fish meal in animal feeding and in human consumption. FAO solicited the support of the International Association for this work. The participants welcomed the plans of FAO and pointed out that in the long run the carrying out of these plans could be of great benefit.

The Executive Committee discussed organizational problems. The submitted draft statutes of the Association were approved by the members.

The first regular annual meeting of the International Association was expected to take place in Paris by the end of September this year.

Three United States companies have applied for membership to the Association.
(United States Embassy, Bonn, August 6, 1960)
Note: Also see *Commercial Fisheries Review*, September 1960, p. 42.

INTERNATIONAL COMMISSION FOR NORTHWEST ATLANTIC FISHERIES

PROGRESS ON STUDIES OF EFFECT OF NET MESH SIZES ON FISH STOCKS:

The International Commission for Northwest Atlantic Fisheries reports considerable progress on a study of the immediate and long-term effects that otter-trawl mesh sizes have on various stocks of fish in the northwest Atlantic.

The progress of the study was reported at the 10th annual meeting of the Commission which was held in early June 1960, in Bergen, Norway. Representing the United States as Commissioners at the Bergen meeting were Thomas G. Fulham of Boston, Mass., and Arnie J. Suomela, Commissioner of the U. S. Fish and Wildlife Service. Suomela is the present chairman of the Commission.

The Commission is composed of members from 12 nations whose fishermen operate off New England, Nova Scotia, Labrador, the west coast of Greenland, and in the Gulf of St. Lawrence. It is primarily concerned with groundfish including cod, haddock, hake, halibut, flounders, whiting, and ocean perch. Member nations are Canada, Denmark, France, Iceland, Italy, Norway, Portugal, Russia, Spain, the United Kingdom, West



International (Contd.):

Germany, and the United States. Delegates from Poland were present as observers at the Bergen meeting.

The mesh-size study was decided on at the ninth annual meeting of the Commission in Montreal, Canada, June 1959. Mesh-size regulations for a part of the area with which the Commission is concerned have been in effect for several years, but the present study is more directed toward determining the effects of various mesh sizes if applied to the entire area, or to all of the north Atlantic fishing grounds. The objective of the study is to see if one mesh size can be applied to all fishing activities in that area.

The technical work of the Commission is done by the fishery biological research units of the member nations. Recommendations for conservation measures, such as mesh-size limitations, when adopted by the Commission are passed on to the member nations. It is the responsibility of each member nation to effect the necessary measures for the guidance of its own fishermen.

The next annual meeting of the Commission will be held in Washington, D. C., in June 1961.

NORDIC FISHERIES CONFERENCE**CONFERENCE MET IN
MID-AUGUST 1960:**

Representatives of the Scandinavian fishery organizations and Ministries of Fisheries met in Karlskrona, Sweden, August 16-18, 1960, to discuss current problems. Denmark was represented by a 35-man delegation, including members from the Faroe Islands.

All the delegations--from Norway, Sweden, Iceland, Finland, and Denmark--were led by their respective Ministers of Fisheries, who, following the Karlskrona session, held a separate meeting at Kristianstad.

Among the topics discussed at the Karlskrona meeting were fish protection, effects of radioactivity on life in the sea, and marketing problems posed by development of the European Economic Community and the European Free Trade Association. In addition, the Ministers discussed fishery problems connected with the territorial waters issue.

(United States Embassy, Copenhagen, August 15, 1960.)

**Angola****FISHING INDUSTRY FACES CRISIS
DUE TO LOW FISH MEAL PRICES.**

The crisis in the Angolan fishing industry is becoming more and more serious and is having grave effects on the economies of the fishing centers. Mocamedes is particularly hard hit because most of the industry, commerce, and agriculture of that area is related directly or indirectly to fishing. Representatives and members of the various business associations in Mocamedes met there on July 21, 1960, to discuss the depression in the industry. The associations passed a motion in the form of a letter which was presented to the District Governor, who was to deliver it to the Governor-General of Angola.

The letter points out that the present crisis has lasted almost two years. The drop in the quantity of the fish catch, the inefficient organization of the industry, the total paralysis of sales, and the catastrophic decline in fish-meal prices threaten the industry with a complete breakdown and endanger the related sectors of the district's economy. While financial and technical assistance will be needed from the Government to solve the long-term problems, the associations declare, it is first necessary to attack the short-term problem--that of preserving what remains of the fishing industry. The assistance given until now by the Government--suspending taxes, cutting export duties, and reducing the price of fuel to the industry--has been helpful but it has not been sufficient to solve the difficulties.

The letter states that 22,000 metric tons of fish meal (43 percent of the amount of fish meal exported by all of Angola in 1959) are stocked at Mocamedes. Exportation has been held back because of the low prices on the international market. Also, the Bank of Angola holds part of these stocks as collateral for loans, the collateral being based on fish-meal prices above the present market prices. The associations declare that it is a primary necessity to export these stocks at least at a price which covers the cost of production.

The motion passed by the meeting also states that the fishing industry owes its fish-

Angola (Contd.):

ermen about 12,000 contos (US\$419,520) in back wages. These should be paid immediately, and the payment of wages coming due in the future should be assured until such time as the industry can be reorganized.

To avoid the complete collapse of the Mocamedes fishing industry and the breakdown of the economy in that district, the motion states that a loan from the Government of 50,000 contos (\$1,748,000) is indispensable. A committee would oversee the expenditure of the money. The Government would be repaid at a convenient time in the future by the levy of a 1- or 1½-percent tax on goods passing through the port of Mocamedes.

In his reply to a telegram from the associations, the Governor-General reviewed actions taken by the Government to aid and solve the problems of the fishing industry, including a recently-allowed subsidy of US\$10 a metric ton on fish meal exported after July 1, 1960, the United States Consul in Luanda reported on August 2, 1960.



Argentina

FISH MEAL AND OIL INDUSTRY:

There are four reduction plants in Argentina--two in Mar del Plata, one in Bahia Bustamante, and a new one in Puerto Deseado. While the capacity of the two plants in Mar del Plata is unknown, their combined annual production has averaged 3,000 metric tons of fish meal during recent years. The plant in Bahia Bustamante (not in operation at the present time) is known to have a very small capacity. The Puerto Deseado plant (due to open in August 1960) expects to have a capacity of 6,000 tons of fish meal annually.

Production of fish meal in Argentina amounted to 3,000 metric tons in 1959. No fish oil was produced in commercial quantities and no exports of fish meal or fish oil were made in 1959.

Fish used for reduction in Argentina are not differentiated by species; reduction plants pay one peso a kilogram (about US\$11 a short ton) for hake and sardines, which are the principal species used for reduction. However, the two Mar del Plata plants rarely

purchase whole fish, but use cannery waste for which they pay 30 centavos a kilogram (about \$3.30 a short ton). Officials of the Puerto Deseado plant estimate that their production costs for fish meal will be \$80 a metric ton (about \$72.58 a short ton).



There has been no recent development or plans for the development of the reduction industry in Argentina other than the new Puerto Deseado plant. Neither the Argentine federal nor provincial governments offer any form of aid to the reduction industry, according to a July 25, 1960, dispatch from the United States Embassy in Buenos Aires.



Australia

THREE-YEAR SHRIMP SURVEY ENDS:

Australian survey of shrimp resources off the eastern Australian coast, which began in July 1957, ended according to plan in June 1960. The survey was carried out by the Fisheries Division, Department of Primary Industry, with the 85-foot chartered vessel Challenge, and was financed by the Fisheries Development Trust Account.

The survey got off to a good start with the discovery, in July 1957, of a new shrimp ground near Fraser or Great Sandy Island, in southern Queensland, covering some 750 square miles and extending from Double Point Light to Indian Head. King prawns were predominant, with tiger prawns the second species.

In November 1959, another new ground was found, extending for at least 15 miles from NE, to NW, of Cape Moreton, also in southern Queensland. This also was a king prawn ground.

The best catches elsewhere were taken in May 1959, off Lakes Entrance, in eastern Victoria, where 100 pounds of king prawns were obtained in 8-9 fathoms. Trawling in deep water was discouraging.

Australia (Contd.):

During the three years of the survey the Challenge covered over 2,000 miles along the coast from Princess Charlotte Bay in northern Queensland to Wilson's Promontory in Victoria. Up to May 2, 1960, a total of 1,942 drags had been carried out, the majority in 20-100 fathoms but some over the "Shelf" in up to 160 fathoms.

The work on the Queensland coast has shown that banana prawns may be found from Indian Head northwards. This is the species favored by the United States market.

Westerly weather towards the end of April 1960 made it necessary for the Challenge, which was then on the New South Wales south coast, to work inshore waters.

Areas searched included Cape St. George to Beecroft Head in 6-30 fathoms, Crookhaven Bight, northern end of Shoalhaven Bight, Black Point to Bass Point (from Kiama), Bass Point to Big Island, Windang Island, NE. of Bellambi Reef. On April 25, the vessel was at Wollongong.

A few school prawns were taken at the northern entrance to the Shoalhaven River and in the vicinity of Windang Island where seven juvenile king prawns were also obtained.

During the last week of April and into May, the Challenge worked inshore waters in the vicinity of Lake Illawarra, Shell Harbor, and Bate Bay, and trawlable ground in 50-120 fathoms from Bass Point to Botany Bay and from South Head to Broken Bay.

Following a report by Dr. Racek of Sydney University that royal red prawns had been taken in quantity in New Zealand in 80 fathoms, it was decided to trawl to 120 fathoms but no results were obtained. Working over the edge of the "Shelf" east of Sydney to Broken Bay, one king prawn was obtained in a night drag in 120 fathoms, but eight day drags yielded nothing.

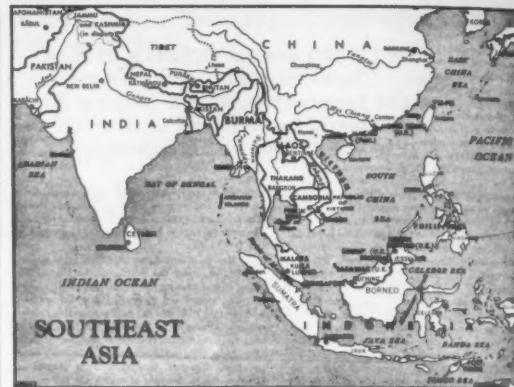
During the last three weeks of the survey, in May 1960, the Challenge worked northwards from Sydney without obtaining any commercially-significant results. (Australian Fisheries Newsletter, June 1960.)



British North Borneo

JAPANESE REVIVING FISHING INDUSTRY:

The first consignment of frozen fish from North Borneo to the United States was shipped in June by a North Borneo trading company, according to British North Borneo newspapers. A Japanese firm has revived the pre-war Japanese fishing operations on Si Amil Island off the Semporna Peninsula in the Celebes Sea area of North Borneo. Pending reconstruction of the cannery and processing factory on the Island, a factoryship, the Ginyo Maru, which has cold-storage facilities, has anchored off the Island for processing operations. Reportedly, 300 Japanese fishermen and technicians are operating 30- to 40-ton trawlers in deep-sea areas in the surrounding waters.



A 1959 Japanese economic mission to British North Borneo seems to have been successful in reviving the fishing industry, states a July 7, 1960, dispatch from the United States Consul in Singapore.



Canada

TRAWLERS TO BE PERMITTED TO FISH IN 3-12 MILE ZONE OFF EAST COAST:

Canadian newspapers announced on August 7, 1960, that Canada's Fisheries Act will be amended at the next session of Parliament to permit large otter trawlers to fish in the 3-12 mile zone off Canada's Maritime Provinces on the east coast. The vessels now by law confine their fishing in the area outside the 12-mile limit, while foreign fishing vessels are permitted to fish off Canada's east coast up to the 3-mile limit. The amendment would give large Canadian fishing vessels equal fishing rights with foreign fishing fleets off the coasts of Prince Edward Island, Nova Scotia, and New Brunswick. The present law does not apply to the coast of Newfoundland.

The Canadian Minister of Fisheries in reply to a question raised in Parliament on August 9 as to whether the Government was contemplating a change in present Canadian law which prohibits the larger Canadian trawlers from fishing within 12 miles of the coast of the Maritime Provinces noted that the Government was concerned with the matter and "is studying possible means of remedying this anomalous situation." (United States Embassy report from Ottawa, August 9, 1960.)

* * * * *

Canada (Contd.):

LAKE ERIE SMELT TRAWL MAY BE ADAPTABLE TO SARDINE FISHERY:

Catches of up to 5,000 pounds of smelt in 10-minute tows have been achieved with an improved combination bottom, midwater, and surface trawl designed by the Industrial Development Service, Department of Fisheries of Canada, and operated in Lake Erie. This development led to the idea of modifying this trawl for the catching of sardines in the Bay of Fundy. Stretched-mesh sizes ranged from 4 inches in the wings and fore section of the body, 3 inches in the second section, and 2 inches in the third section of the body, then one inch in the tapered lengthening piece and $\frac{1}{2}$ inch in the cod end. The net has a square section and the dimensions of the mouth are 30 feet square. The first trials with the sardine trawl were carried out by a 50-foot dragger in the Bay of Fundy near Beaver Harbor, New Brunswick.

The results of the preliminary trials indicate that the trawl has a potential application to this particular fishery. The dragger's captain feels confident that a winter trawling operation on scattered schools of herring when using this gear will create a new source of income for draggers which, otherwise, would be idle.

* * * *

MECHANICAL DIGGER DEVELOPED FOR SOFT CLAMS:

Considerable success has already been achieved by the Fisheries Research Board of Canada in the development of a mechanical shellfish harvester to replace manual digging operations which are both inefficient and destructive to the small clams which the fishermen leave behind.

It is reasonable to expect that the use of more efficient and less destructive harvesting tools will bring about a long-term increase in clam production.

In order to provide a manually-operated machine within the means of the average fisherman which will operate in places that are inaccessible to the mechanical harvester, a new piece of equipment is being developed. The design and development of the machine are being undertaken by the Fisheries Research Board at its St. Andrews Biological Station in cooperation with the Department of Fisheries' Industrial Development Service.

**Cuba****CLOSED SEASONS FOR CERTAIN SHELLFISH REVISED:**

By a resolution dated July 11, 1960 (published in the Official Gazette, July 14, 1960), the Cuban National Fishery Institute decreed that the closed season on tortoise and turtle species previously ordered to be in effect from June 15 through August 30, 1960, would be lifted on August 10, 1960, in consideration of the precarious economic situation of the fishermen. A closed season on river shrimp or prawns announced in the Official Gazette of June 30, 1960, is effective from June 15 to August 30, 1960, and on the same date the closed season on spiny lobster (Panulirus argus langosta) was lifted effective June 15, 1960.

In another resolution published in the Official Gazette of June 30, 1960, the Institute ordered a closed season from July through October 15, 1960, on moro crabs (Menippe mercenaria). (U.S. Embassy, Habana, July 25, 1960.)

**Denmark****FISHERIES TRENDS,
SECOND QUARTER, 1960:**

Although statistics on the landings of fish and shellfish in Denmark for the second quarter of 1960, are not complete, it is estimated that landings improved somewhat over the first quarter, but still lagged behind the record set in 1959. Decreased landings of fish for reduction into fish meal and oil were responsible for the drop this year as compared with last year. Low ex-vessel prices for fish for reduction have forced the Danish vessels to turn to fishing for edible fish. A few of the modern steel vessels, which were designed for industrial fishing, have been leased to foreign countries.



Beached Danish fishing boats.

Denmark (Contd.):

The sharp drop in world fish meal prices is attributed partly to Peruvian competition, and the low price for solubles to the poor market in the United States which is Denmark's principal customer for that product.

During April-June 1960, attempts by rainbow trout exporters to stabilize the market were unsuccessful. The Association of Trout Producers disbanded after failing to reach a workable agreement on price controls.

In Greenland a new shrimp-canning factory was opened at Christianshaab in mid-June. This new factory will double Greenland's capacity for packing canned shrimp. Shrimp-peeling machines from the United States are being used in the new cannery. (United States Embassy, Copenhagen, report of July 12, 1960.)

* * * * *

EXPANSION OF GREENLAND'S FISHERIES UNDER CONSIDERATION:

A project for joint Danish-Faroese-Greenlander exploitation of the Greenland fishing banks is currently under consideration, according to a July 31, 1960, press statement by the Director of Royal Danish Greenland Trade. Should the plans materialize, Godthaab would become the base for a fleet of larger fishing boats and trawlers, with the catch to be landed and processed at that port. Only through the development of greater processing facilities, said the Director, could the Greenlanders themselves benefit economically from any extension of their territorial waters, since they lack vessels large enough to exploit the farther reaches of those waters. And inasmuch as the cod, Greenland's principal commercial fish, appears periodically to forsake the coastal waters for the banks, it is feared that without vessels to follow any such move the fishing industry, so vital to Greenland's economy, would be subject to sudden collapse.

The Director estimated that Greenlanders take less than 10 percent of the current catch in Greenland waters, and stated that at present not a single Danish-based fishing vessel is operating there. Faroese fishermen appear to be fairly active there, however. Fragmentary figures cited in the press statement indicate that this season the Faroese and Greenlanders have already taken up-

wards of 2,500 metric tons of fish in the Sukertoppen and Egedesminde districts, currently the best Greenland waters for cod.

When the Minister for Greenland recently visited Greenland, he promised that the improvement of fishing facilities would receive top priority in plans for Greenland's economic development, states an August 3, 1960, dispatch from the United States Embassy in Copenhagen.

**El Salvador****SHRIMP FISHERY TRENDS, JULY 1960:**

Shrimp is El Salvador's third major export (after coffee and cotton), and the bulk of the catch is flown frozen to United States markets.

Despite intermittent talk of possible conservation measures, a new firm with substantial capital is planning to enter the fishing industry and will probably lead to further development of fishery resources. In another development, the major firm now fishing in El Salvadoran waters is building its own pier and handling facilities at La Union on the Gulf of Fonseca (U. S. Embassy in San Salvador, July 15, 1960.)

**Fiji Islands****TUNA CANNERY WITH JAPANESE INTERESTS:**

An important planter on Ovalau, Fiji Islands, has reportedly with Fiji Government approval entered into an agreement with Japanese interests to establish a tuna cannery at Lovuka and utilizing the existing wharf and sheds. In this connection, a partner in a Japanese firm recently visited Fiji. It is believed that Japanese personnel would be brought in to operate the cannery and that the fish (mostly tuna) would be provided by one or more of the Japanese fishing companies now operating in South Pacific waters. (United States Consulate, Suva, July 28, 1960.)



France

FISH MEAL AND OIL INDUSTRY AND MARKETS:

French imports of fish meal from the United States and other General Agreement on Tariffs and Trade (GATT) countries are theoretically subject to a 15-percent duty; however, in practice, the duty since 1955 has been 10 percent. The theoretical duty could be reverted to at any time. The duty for fish meal of Common Market origin (German, Italian, or Benelux) was reduced to 8 percent on July 1, 1960, and is due to disappear gradually. From November 5, 1958, to February 29, 1960, the duty on fish meal regardless of its origin was completely suspended. There are no quantitative restrictions on the import of fish meal.

Table 1 - French Imports of Fish Meal

Country of Origin	Quantity Imported		Average Import Price	
	1st Half 1960	1959	1st half 1960	1959
(Metric Tons)				
Belgium-Luxembourg	90	-	118	-
Chile	792	-	112	-
Denmark	-	534	-	209
Iceland	-	1,384	-	193
Japan	-	565	-	174
Morocco	1,279	9,653	128	150
Norway	4,488	16,971	137	179
Peru	7,938	1,871	127	147
Portuguese terri- tories in Africa	148	1,442	101	160
St-Pierre & Miquelon	191	-	132	-
Tunisia	83	-	82	-
Union of South Africa	302	2,741	170	167
United Kingdom	20	3,461	152	189
Others	251	1,240	-	-
Total	15,582	39,862		

1/Values converted at rate of US\$1.00 equals 4.93 new francs.

Halibut oils coming from the United States and other GATT countries are theoretically subject to a 30-percent duty; however, this duty has been completely suspended since 1955. Halibut oils of Common Market origin are exempt from duty. There are no quantitative restrictions on the import of halibut oils.

Oils and fats of other fish coming from the United States and other GATT countries are theoretically subject to an 18-percent duty, but this duty has also been suspended since 1955. Imports from Common Market countries are exempt from duty. Crude herring oils, alimentary fluid oils, and refined oils are still subject to quota restrictions, but other fish oils and fats are free of quantitative controls.

French production of fish meal increased from 6,000 metric tons in 1952, to 8,500 tons in 1955, to 14,000 in 1958, and to 18,000 in 1959. This increase is primarily attributable to a larger supply of raw materials, particularly waste from canning, filleting, etc. Nevertheless, the supply of waste products is limited (less than 20 percent of France's fish production is canned and less than 10 percent is filleted), and further expansion of fish-meal production will depend to a large extent on better methods of collecting and preserving the waste, the level of production activity in the canning and filleting industry, and the possibility of using more whole fish.

While the fish meal produced in France is of an acceptable grade, the principal raw material (waste products) is poor in quality and low in protein content compared with whole

fish. The industry has been trying to improve the quality of its fish meal by using a greater quantity of whole fish, and efforts were made in recent years to persuade fishermen to fish for the reduction industry. These efforts resulted in an increase in the amount of whole fish supplied to the industry, but the total quantity remained small compared with the amount of waste products used. Damaged and unsold fish are also used in the production of meal.

The price of whole fish, of course, is much higher than that of fish waste--2.0 U. S. cents to 3.2 cents per kilo (US\$1.8-2.9 a short ton) for whole fish as compared with 1 cent a kilo for waste (\$9 a short ton), and the use of whole fish depends on the price that can be charged for fish meal. The trend toward greater use of whole fish came to an abrupt end in November 1959, when the suspension of the fish-meal duty lowered the price of imported fish meal. In spite of the restoration of the duty in February 1960, competition from low-priced Peruvian fish meal has prevented the industry from renewing its effort to use more whole fish.

Fish oil, a byproduct of the fish-meal industry, is produced in very limited quantities in France, and some of the fish-meal plants discard the oils derived from the production of fish meal. Fish-oil production in 1956 was estimated to be 2,000 to 2,500 metric tons and may have risen to 3,000 tons in 1959.

Table 2 - French Imports of Fish Oils

Type and Country of Origin	Quantity Imported	
	1st Half 1960	1959
(Metric Tons)		
Halibut: Norway	1	40
Other:		
Belgium-Luxembourg	21	124
Japan	92	164
Madagascar	-	87
Morocco	1,786	3,259
Norway	291	734
Peru	-	325
Portugal	186	543
Spain	90	30
United States	23	51
Viet Nam	-	71
Other	10	40
Total imports	2,500	5,468

Note: The French customs nomenclature does not distinguish between fish-body oil and other fish oils. In addition to the two categories of fish oils, the customs statistics also show imports of "oils from sea mammals" and "cod-liver oil," which are not included.

Fish meal and fish oils are produced in France by about 20 plants located on the North and Atlantic coasts and in the Paris area. None are situated along the Mediterranean coast. A trend toward concentration has been taking place in recent years, particularly in the port areas where the supply of raw materials can generally support a single plant and no more. However, most French fishery reduction plants are overequipped, and can cope with an irregular supply of raw materials; it is believed that total capacity of the industry is several times actual production.

French consumption of fish meal (about 2.2 pounds per capita) is relatively low compared with such countries as Great Britain (11.0 lbs.), the Netherlands (22.0 lbs.), and Denmark (40.0 lbs.); however, consumption is increasing and it is expected to continue to increase because of the growing demand of cattle breeders, dairy and poultry farmers.

While the industry is probably capable of satisfying the domestic demand for fish meal and fish oil, it is unlikely that production will increase significantly in the foreseeable future because of the lack of further supplies of low-

France (Contd.):

cost raw materials. Imports can therefore be expected to continue and purchases will be made where the most favorable price can be obtained. (United States Embassy, Paris, August 3, 1960.)



French West Indies

UNITED STATES TUNA CANNER INTERESTED IN BUILDING COLD- STORAGE PLANT IN MARTINIQUE:

The Prefet of Martinique in August 1960, had a visit from a group of United States and French industrialists interested in building a cold-storage plant for fish in Martinique, French West Indies. The Americans represented a large California tuna canner and the French represented the French subsidiary of the California firm. The visitors explained that they wish to ship to the United States French-caught tuna coming from off the west coast of Africa. However, in order to avoid the reportedly high costs which would result from shipments in French vessels, they plan to tranship in United States vessels. For this, cold-storage facilities at the point of transhipment are necessary. The Prefet said that other United States fish-packing interests had similar arrangements at Trinidad and Haiti.

The Prefet expressed his complete support of the proposal and said that he has requested 100 million old francs (US\$203,000) from the French Government to enable the Department of Martinique to put into usable condition a pier and to dredge the approaches in the area where the industrialists plan to build the cold-storage plant, at the eastern edge of the Fort-de-France port area. Next year, he said, as construction on the cold-storage plant gets under way, he will request an additional sum of from 500 million to 700 million old francs (\$1.0 to \$1.4 million) in order for the Department to build much better dock facilities.

He added that the industrialists were particularly interested in plans now under way for the construction of a new pineapple packing plant in the area where they intend to put up the cold-storage plant. It seems as if it recently has been discovered that fish meal used in animal or poultry feeding is enhanced if mixed with the waste from

pineapple packing. (United States Consulate, Martinique, August 13, 1960.)



German Federal Republic

TECHNOLOGIST DEVELOPS NEW METHOD FOR PRESERVING FISH AT SEA:

A technologist of Hamburg, West Germany, has announced the development of a new method of preserving fish aboard vessels. The method would entail the storage of freshly-caught fish in airtight tanks. The air would then be evacuated from the tanks and temperatures reduced quickly to about 1° C. below the freezing point in a vacuum. This process would not only remove gases from the body of the fish but also, through the evaporation of moisture, freeze the surface of the fish to prevent it from drying out and to keep it fresh. In the absence of oxygen, the development of aerobic bacteria would be virtually eliminated.

The cost of a vacuum plant for installation aboard West German trawlers is estimated at about DM600,000 (about US\$142,900). A trawler thus equipped would save present expenses for ice and possibly improve the value of its catch by as much as 10 percent.

The Federal Fisheries Research Institute of Hamburg has tested the new preservation method in a shore installation with very good results. The Institute recommends the experimental installation of such a vacuum plant aboard a commercial trawler or aboard a West German fisheries research vessel. (United States Consul in Bremen, August 3, 1960.)



Greece

FREEZER-TYPE TRAWLERS REPORT GOOD CATCHES IN JUNE:

The four freezer-type trawlers fishing off the coast of Northwest Africa (Mauretania), in June 1960, caught and froze 1,300 metric tons of fish. The freezer-trawlers were expected to exceed this amount in July.

The new freezer-trawler Zephyros II returned to Piraeus from the Northwest African fishing grounds about June 1 with 352 tons of frozen fish. (Alieia, July 1960.)

* * * *

Greece (Contd.):**SARDINE AND ANCHOVY LANDINGS GOOD IN JUNE:**

During June, landings of anchovies and sardines in Greece were very good, according to the July 1960 Greek fisheries periodical Alieia. The fish canneries and salting plants were busy processing the catches.

As a result of the plentiful supplies, ex-vessel prices dropped to 13 drachmas per kilo (about 5.9 U. S. cents a pound) for large anchovies (about 6 inches).

**Greenland****SHRIMP INDUSTRY EXPANDS:**

Shrimp production in Greenland is expected to double this year with the operation of a new shrimp-processing plant in Christiansaab as part of a large investment.

Later a shrimp plant will be built in Jacobshavn, and there is a proposal to give a private Danish company permission to build a shrimp plant in Godhavn on Disko Island. Fishermen receive 50 to 80 øre per kilo (3.3 to 5.3 U. S. cents a pound) for heads-on shrimp. The shrimp grounds in Disko Fjord are considered to be the world's richest by biologists. They are considered to be inexhaustible because they are steadily replenished by the addition of young shrimp from the ocean. (Fiskeritidende, July 13, 1960.)

**Guatemala****JAPANESE COMPANY GRANTED PERMIT TO FISH OFF COASTS OF GUATEMALA:**

A Japanese fishing company has been granted a commercial fishing permit for both coasts of Guatemala up to the 12-mile limit for a period of 10 years. The permit includes the following provisions: (1) Fishing operations may be subcontracted with approval of the Ministry of Agriculture. (2) Foreign fishing boats may operate in Guatemalan waters for 6 months before having to secure Guatemalan registration. (3) Refrigerator boats of the company must be Guatemalan-registered. (4) The company must sell to the Guatemalan Government all that the latter may require at prices fixed by the

Ministry of Agriculture (but in no case at less than production costs). The company must start operations by August 5, 1961. The company may rent national land for 5 years for warehouses, housing, refrigerator space, etc., and its installations and boats may enjoy concessions under the Industrial Development Law. (United States Embassy, Guatemala, August 11, 1960.)

**Hong Kong****GOVERNMENT AIDS FISHING INDUSTRY:**

Typhoon "Mary" which hit Hong Kong in June, damaged 123 fishing craft beyond recovery or repair and washed out the oyster beds north of Castle Peak. Rehabilitation loans and grants were quickly made available to the fishermen affected for the purchase of new boats and gear, and in general, fishing operations were soon resumed. Fresh marine fish landings declined successively during the April-June 1960 quarter from March levels.

The Fisheries Development Loan Fund Advisory Committee held its first meeting in April to establish the principles under which fishermen will be enabled to buy through the HK\$2-million (about US\$350,000) fund Diesel engines, navigational aids, motor winches, and other modern fishing gear. (United States Consulate, Hong Kong, July 18, 1960.)

**Iceland****FISHERIES TRENDS, MID-JULY 1960:**

The Icelandic north coast herring season by July 9, 1960, had far exceeded even the high levels of the 1959 season. The over-all quality of the herring catch has been comparable to last year's. As of July 9, 1960, 48,033 metric tons had been delivered for processing as compared to 21,235 tons for the same period last year. Most of this year's catch (43,861 tons) went to the reduction plants and most of the balance went for salting, except 83 tons exported directly to Denmark on ice. The lean herring was still being processed for meal and oil despite the decline of world market prices for those products, and large stocks stored in Iceland.

Iceland (Contd.):

The controversial new small trawler flounder fishing arrangements within Iceland's 12-mile fishing limits now permit small vessels to bring this catch in to the Westman Islands.



Westman Island, Iceland, fishing harbor, showing vessels at dock and processing plant.

Various plans are being tried in selling this product, including flounder shipments on ice directly to Denmark. This type of landing was protested on July 12 by Danish fishermen. One enterprising Icelandic exporter is shipping the flounder by air in plastic bags to Amsterdam for the Dutch market. The planes also carry other fishery products.

Municipal authorities on the Westman Islands insist that the shipments not take place unless there can be a guarantee of high quality. Flounder shipments, it is understood, must arrive at the market within 36 hours after being caught. Shipment by air in aluminum boxes has been advocated.

Icelandic whaling operations, which are based on a single shore plant, have been progressing quite satisfactorily this season. By July 7, 153 whales had been landed, compared with 128 for the same period of 1959. (United States Embassy, Reykjavik, July 15, 1960.)

* * * * *

HERRING FISHERY TRENDS, JULY 1960:

During the latter half of July 1960, the Icelandic north coast herring landings began to lag behind the very good landings made during the same period of 1959. As of July 24, about 68,220 metric tons of herring had been landed compared with 77,522 tons by the same date in 1959. A far smaller amount was of good enough quality to deliver for salting—10,090 metric tons as compared with 16,933 metric tons by July 24 last year. Most of the remainder was used for meal and oil.

**India****NEW FIVE-YEAR PLAN PROVIDES FOR RAPID EXPANSION OF FISHERIES:**

Landings of fishery products in India, estimated at 1.0 million metric tons at the end of the First Plan, is expected to increase to 1.4 million tons by 1960/61 and to 1.8 million tons by 1965/66, according to the Third Plan Draft Outline. Nearly two-thirds of the increased production during the Third Plan is expected from marine fisheries.



A view of the quay-side, Cochin, India, where the fish catch is auctioned. Dugouts shown are traditional small fishing vessels of the region.

The mechanization of fishing craft and development of designs for fishing craft suitable for different sections of the coast were taken up in the First Plan. By the end of First

India (Contd.):

Plan, about 650 boats had been mechanized, mostly in Bombay. Another 850 boats have been mechanized since the beginning of the Second Plan in Bombay, Kerala, Mysore, Madras, Andhra Pradesh, and Orissa. Training in the use and maintenance of mechanized boats is being provided at 9 centers in different states.

During the Third Plan, the program of mechanization of fishing craft will be expanded to effect mechanization of about 4,000 boats. Special emphasis is to be given to the exploration of new fishing grounds and to the exploitation of marine resources through cooperatives as well as through private fishing companies.

Development of fishing harbors and berthing facilities will also be taken up. The provision of refrigerated rail cars and insulated trucks for the transport of fish over long distances has been included in the program. As regards inland fisheries, about 300,000 acres of inland waters have been surveyed, about 13,000 acres have been reclaimed, and over 600,000 acres have been stocked through 1958/59. A training course in inland fisheries and management has also been organized. The program for the Third Plan will include survey of about 300,000 acres, reclamation of 6,500 acres, and stocking of another 200,000 acres, states a July 21, 1960, report of the U. S. Foreign Agricultural Service in New Delhi.



Italy

FISH MEAL AND OIL MARKET:

The domestic production of both fish-meal and fish-body oil in Italy is limited and the annual requirements of those products must be met largely by imports. The annual requirements for fish meal are estimated to be 13,500-14,500 metric tons and for fish-body oil about 7,500 tons. Imports of fish meal in 1959 amounted to 13,258 tons valued at US\$2,248,000. Of this amount 6,321 tons (47.7 percent) was imported from Angola. Other suppliers were Norway, Denmark, Portugal, and to a limited extent, Communist China. Imports of fish-body oil totaled 7,780 tons valued at \$1,599,000 in 1959. Among the principal suppliers were the United States (1,215 tons) and Norway (965 tons).

Prices c.i.f. Italian port for imported fish meal quoted by the National Association of Feed Producers and the Cooperative Organization of the Agricultural Farmers in July of this year were: Angola fish meal, mechanically-dried, 65-percent protein, \$85-87 a metric ton; naturally-dried, 60-65 percent protein, \$82-83 a ton; and Peruvian fish meal, 65-percent protein, \$84 a metric ton.

Average prices for marine oils (all taxes and fees paid) as of early August this year were as follows: whale oil, 165 lire a kilo (about 12.05 U. S. cents a pound); shark-liver oil, 160 lire a kilo (about 11.68 U. S. cents a pound); sardine oil, 135 lire a kilo (about 9.86 U. S. cents a pound); and cod-liver oil, 160-220 lire a kilo (about 11.68-16.07 U. S. cents a pound).

Imports of fish-meal and fish-body oil into Italy are unrestricted. Duties as of June 30, 1960, applied to the c.i.f. value are 8.1 percent ad valorem for fish meal from European Common Market countries and 9 percent for fish meal from other countries. Other charges or taxes include an administrative fee of 0.5 percent on the c.i.f. value and an Italian Government exchange tax of 3.3 percent on the c.i.f. value. These latter charges are also applied to the c.i.f. value of fish oil imports which are otherwise free of duty. (United States Embassy, Rome, July 22, 1960.)

* * * * *

SUBSIDIES FOR FISHING INDUSTRY AS OF JUNE 30, 1959:

Italian legislation passed in 1957 authorizes subsidies for fishermen, fishing cooperatives, and fishing concerns up to 40 percent of the cost of new or improved craft, fishing equipment, works and installations for preserving or processing, and transporting products for coastal fishing operations only. As of June 30, 1959, 460 subsidies were granted totaling 786 million lire (US\$1,267,000) for investments of 2.2 billion lire (US\$3,545,000). Of these, 132 had received actual payment of 176 million lire (US\$284,000) for total investments of 459 million lire (US\$740,000). (United States Embassy, Rome, July 11, 1960.)



Japan

AUGUST PRICE FOR FROZEN YELLOWFIN TUNA EXPORTS TO UNITED STATES LOWER:

The Japanese Export Tuna Freezers' Association held a meeting of its Directors on July 29, 1960, to discuss the basic export price for shipments of frozen yellowfin tuna to the United States for August. This meeting followed a meeting held on July 25, between this association and the Frozen Foods Export Association which ended in disagreement on the August export price. At the July 29 meeting, the producers voted to make an across-the-board cut of \$20 a ton from the US\$260-a-ton base price which had prevailed from April to July. The new base price will be US\$240 f.o.b. Japan for 20-80 pound gilled and gutted clipper-frozen yellowfin tuna.

The meeting also decided to add the port of Willemstad on the Island of Curacao in the Caribbean to the list of approved ports for transshipment of tuna to the United States. One Japanese fishing company had asked for approval of this transshipment port some time ago.

The \$260-a-ton price for yellowfin for the United States market held up strongly during April and May, but thereafter, as the American purse-seiners continued to make good catches of yellowfin, and the United States canned tuna market softened, the price gradually fell. At present, deals at \$235 are considered the usual thing, and for this reason the exporters' association had asked that the price be brought down to \$230. Since the producers have agreed to the price of \$240, it looks as if the exporters will compromise at that figure. (The *Suisan Tsushin*, July 30, 1960.)

* * * * *

BASE PRICE FOR TUNA EXPORTS TO ITALY TO BE REEXAMINED:

The Japan Frozen Foods Export Association's agreed price for export of tuna to Italy is at present US\$270 per metric ton c. & f., but it is reported that the actual market has already fallen below \$220. Since the spread from the agreed price is so great, sentiment is rising for doing away with the agreed price or establishing a new agreed price consistent with the actual situation. The Association's committee on Italian exports is expected to produce a decision shortly.

At present there is in Italy about 8,000 metric tons of frozen tuna in storage, of which the packers are holding 3,000 tons and the Japanese 5,000 tons, so that there is no prospect at present of the market's recovering. However, there are prospects for Yugoslavia to resume import licensing in September, and in the autumn all of the boats fishing the Atlantic will switch over to albacore and stop catching yellowfin, so the trading companies are hoping that the situation will recover considerably by the end of the year. (The *Suisan Tsushin*, July 30, 1960.)

* * * * *

ITALY BUYS FROZEN TUNA ONLY IN SMALL LOTS:

The attitude of the Italian fish-canning industry on purchases of Japanese frozen tuna is showing a big change since the recent sharp drop in the world tuna market. Up through July 1960, they bought entire vessel trips, but in August there were no such purchases. Italy is reported buying in small lots of 5, 10, or 30 metric tons, or as they need the fish. This is because of the accumulation of frozen tuna stocks in Japanese hands, which makes it possible for the Italian packers to buy whenever they need tuna. This accumulation of stocks and the fact that future market prospects are completely unstable have brought about this situation.

Furthermore, at present quality claims are being filed on 50 to 60 percent of the tuna sold to Italy. Second-grade tuna is not, as in the United States, completely discarded, but is used as raw material for second-grade canned tuna. However, the second-grade product is retailed much cheaper than first-grade tuna, 300 lire as compared with 500 lire (48 U. S. cents as compared with about 80 cents) a can. With the increase in second-grade raw tuna, the price for frozen tuna is tending to drop even lower. The discount in price on fish against which quality claims are made has recently been more than 40 percent. (The *Suisan Tsushin*, August 8, 1960.)

The Vice-President of the Japanese Tuna Fishery Federation stated recently in the *Nippon Suisan Shimbun* that all of the salmon and mackerel fishermen who want to get into tuna fishing do not realize the real situation in tuna. They all think tuna fishing is profitable, but the fact is that of the 1,800 tuna operators, half are in business difficulties.

* * * * *

Japan (Contd.):

CANNERS HAVING TROUBLE MEETING CONTRACTS FOR LIGHTMEAT TUNA IN OIL:

According to a Japanese fisheries periodical, the Japanese fishermen are experiencing the worst skipjack season in 10 years or more, and the packers are short on canned lightmeat tuna contracts for Europe. They had hoped that the July 1960 big-eyed tuna landings would help, but that species is not coming in either. It was estimated that for June and July there would be about 100,000 to 150,000 cases that were contracted for but could not be delivered.

Traders are seeking extensions of contracts, but it is thought penalties will have to be paid on most of the contracts as future production prospects are poor.

With an export price of US\$6.20 to \$6.30 a case f.o.b. for lightmeat tuna in oil, and a domestic price of \$6.11-\$6.39 a case, the market is somewhat above normal, but as the ex-vessel price of skipjack is staying above 70 yen a kilogram (about \$176.00 a short ton), the canners are losing more than 300 yen (about \$0.83) a case.

* * * * *

EDITORIAL HIGHLIGHTS CANNED TUNA EXPORT PROBLEMS:

An editorial ("On Solutions to Canned Tuna Export Problems") in the Japanese periodical *Suisan Keizai* highlights Japanese canned tuna export problems. The editorial points out that it has been decided to cut the price of canned white meat tuna for export to the United States by \$1 a case. There was an earlier cut of \$1 at the end of February 1960, which means that within only one year the price of white meat tuna, which was \$11 a case last summer, has been cut by \$2. This softening of the United States market is reported to reflect the effects of an increase in imports into the United States of third-country merchandise and good tuna catches by the United States tuna fleet. In particular, the invasion of the United States market by third countries was beyond expectations, and it has forced Japanese goods into a stiff competitive struggle. Concerned industry circles appear to consider that by the end of the export year the quantity of third-country goods will be double that of last year.

It has to be admitted, continues the editorial, that this is a depressing development for the Japanese canning industry, which has assiduously cultivated the United States market. The Japanese canned tuna production quota for this year is 2.28 million cases, and with a hold-over of 120,000 cases from last year, this makes a total of 2.4 million cases to be disposed of this year. However, the amount offered for sale as of July 1960, was 1.58 million cases, and a considerable quantity of that is still not contracted for, the amount actually having been disposed of being reported as about 1 million cases. At this time of the year, if things had been going smoothly, 1.7 or 1.8 million cases would have been sold, but the movement of merchandise has been unexpectedly slow and there has been no expansion of sales at all. Consequently, the joint sales company's inventories are just increasing, and appear to have reached about 1 million cases.

The industry is trying to figure out what to do to remedy the situation, according to the editorial. However, in the present buyer's market, with the Japanese industry not in a position to take the initiative in the United States market, there does not seem to be any brilliant solution in sight, and that has led to the \$1 cut in the white meat price in an attempt to step up sales. This has been a real headache for the industry, for this year ex-vessel prices for both albacore and skipjack are unusually high, and the canned tuna price cut is making it more and more a situation of "buy high and sell low." Since the price of skipjack is more than twice that of last year, it has brought packing of light meat in oil to a complete stop. It is calculated that with the ex-vessel price of albacore at 120 to 140 yen per kilogram (approximately US\$302 to \$353 a short ton), \$10 a case is barely breaking even. Consequently the recent price cut means that most of the packers are operating in the red.

There is no possibility, as there was last year, of covering the loss with skipjack packing, says the editorial. The tuna canning industry, which has been carefully fostered since the mid-1920's, now has problems. Of course, the industry should get together, and with the trading companies and financial agencies, should get itself into a firm position for the long haul, in order to overcome its difficulties. But may it not be necessary at this juncture to forget about prestige as the biggest canned tuna exporting country in the

Japan (Contd.):

world, and cut back production temporarily in order to put the industry's house in order?, asks the editorial. (Suisan Keizai, July 22, 1960.)

* * * * *

FISHERIES AGENCY TO REEXAMINE TUNA FISHERY POLICIES:

Tuna fishing is so much a feature of Japanese overseas fishery developments that it is the first thing the Japanese think of when such developments are mentioned. Recently countries of Southeast Asia, such as New Guinea and Ceylon, have been trying to develop their own tuna fishing industries, and within Japan, too, there is a growing desire to change from coastal fishing to tuna fishing brought on by the recent transfer of vessels from the salmon fishery to the tuna fishery. It appears that the Japanese Fisheries Agency, taking this situation into consideration, is getting set for a fundamental examination of the tuna fisheries and a revision of the present licensing policy. When this is undertaken, it is expected that there will be pressure from the Federation of Tuna Fishing Associations.

The moves being made by New Guinea and Ceylon are natural for countries which are backward in fishery technology. Recently the Ceylonese have asked to buy 20 tuna vessels, and the large number of vessels involved has given the Japanese industry pause. At this rate the South Pacific and Indian Ocean tuna fisheries may in the near future cease to be a Japanese monopoly, and the real wish of the Japanese industry is that insofar as possible such requests should be met by dispatching Japanese tuna boats.

In Japan, since the authorities permitted the changeover of some salmon boats to tuna fishing, the coastal fishermen have repeatedly made representations to the Fisheries Agency to permit depressed coastal fishermen to also enter the tuna fishery. In short, the tuna fishing industry is facing an important period of change, both at home and abroad, and the situation can no longer be dealt with under the present licensing policy, which has been repeatedly patched up with partial remedies.

At present the Fisheries Agency sections concerned are thinking in terms of the fishermen who have been squeezed out of their fishing grounds by the "Rhee Line" (between

Korea and Japan) and those who have lost their coastal fishing grounds because of the mysterious "Minamata" disease. They are also examining new licensing policies which would apply to public fishery corporations which are having business difficulties in various parts of the country. These probably can not, however, be solidified into a plan without considerable dissension. (The Fishing Industry Weekly, July 15.)

* * * * *

FROZEN TUNA EXPORTS LAG:

Japanese exports of frozen albacore and yellowfin tuna to the United States are almost at a complete standstill. This is attributed to the excellent landings by the California converted clipper-seiners, according to the August 8, 1960, issue of The Suisan Tsushin. Due to the good California yellowfin fishery, it is probable that all United States tuna packers have ample raw material on hand. For this reason Japan's export market for yellowfin in the United States, despite the new export price of \$240 a short ton established early in August, is so poor that the agreed price is not being observed. It is reported that offers are already being made at \$230, but even at that price there are no sales contracts being made.

The article also points out that because of the good catch, the price of California albacore was recently lowered from \$375 to \$325 a short ton, but according to advice received by Japanese trading companies, the big California packers have announced that after August 8, they are reducing the price to \$300.

* * * * *

MARKET FOR TUNA VESSELS WEAKENS:

The recent moves in the direction of a revision of tuna vessel licensing policies have produced unexpected repercussions in the Japanese tuna fishing industry, and the progress of events is being watched. Particular attention is being paid to the activities of the subcommittee of the Fisheries Regime Survey Council, which is gathering concrete data for its meeting in September 1960.

The extension of the tuna fishing grounds to greater distances has stimulated construction of larger vessels, and has given rise to excessive competition in the process. This phenomenon has produced various problems, particularly: (1) the cost per ton for larger

Japan (Contd.):

tuna vessels has risen very high, about 270,000 yen (about US\$750) per ton for 70 gross ton vessels, 250,000 yen (US\$694) per ton for 100-ton vessels, and 230,000 yen (US\$639) per ton for 180-ton vessels; (2) under the Special Exemption Law, medium and small vessels were replaced with larger ones, and the total number of operators was reduced, but despite this there was an increase in the catch, though at the same time domestic processors began to suffer a shortage of raw material; (3) in connection with mothership-type tuna operations, there was a tendency for tuna fishing rights to become concentrated in the hands of large enterprises; (4) a rise in costs brought about by construction of larger vessels and changes in working conditions has had a bad effect on distribution and consumption; and (5) a question had arisen with regard to the suitable size of the tuna fleet, and there is great concern over what measures the subcommittee will work out to meet these problems.

Because of these developments, the trade in tuna vessel construction rights, which has been a seller's market, has shown a slow down of buying, and there are some reports that trading in tonnage rights has stopped. (The Suisan Tsushin, August 3, 1960.)

* * * * *

NEW CANNED TUNA PRODUCT ON MARKET:

A new canned tuna product, "Tender Tuna," which a Japanese processing firm put on the Japanese market late in June 1960, is enjoying good acceptance. Consumption has been about twice as high as expected.

Characteristics which have made the new product a hit with the consumers are: (1) the flavored oil and water sauce in which it is packed can be used in cooking as a flavoring agent; (2) it has a distinctive flavor and a tender texture; (3) it is processed so as to resemble chicken; (4) the tuna meat is packed in the form of blocks; (5) no fish design is used on the label; and (6) it is comparatively cheap.

At present the product is put up in flat No. 2 and No. 3 cans in four different flavored sauces: soy, tomato, stew, and curry. The No. 2 can sells at retail for 55 yen and the No. 3 can for 35 yen (approximately 15

cents and 10 cents, respectively). The Suisan Tsushin, July 20, 1960.)

* * * * *

PURSE-SEINERS DEMAND LICENSES FOR TUNA FISHING:

A big deputation of seiners from western Japan called on the Japanese Fisheries Agency on August 1, 1960, to demand that operators of about 40 seiners be granted tuna-boat licenses totaling 4,000 gross tons to compensate them for being squeezed off their fishing grounds by the Rhee Line. (The Suisan Keizai, August 2, 1960.)

* * * * *

SKIPJACK TUNA LANDINGS LIGHT IN KOCHI PREFECTURE:

Skipjack tuna fishing by Japanese vessels from Kochi Prefecture in July 1960 should have been at its seasonal peak, but the catch was very poor. If it continues at this rate, this may be the poorest season ever experienced.



Japan (Contd.):

According to a survey by the Kochi Prefecture Fisheries Department, there are about 400 skipjack vessels in the Prefecture, including part-time skipjack vessels of less than 5 gross tons, and they are principally based at Tosa Shimizu, Usa, and Suzaki. They fish off the Kochi coast, making trips of at most 2 days, and produce from 3,800 to 5,600 metric tons of skipjack each year.

However, this year the vessels of the Tosa Shimizu Fisheries Association landed from January through May only 78 tons of skipjack, less than one-fourth of the 358 tons landed in the same period last year. Other associations, such as those of Usa and Suzaki, also reported landings of $\frac{1}{4}$ to $\frac{1}{3}$ last year's.

The Experiment Station blames the poor fishing on unfavorable oceanographic conditions, among them lower than average water temperatures and a displacement southward of the Kuroshio Current away from the Japanese Islands. (The Fishing Industry Weekly, July 15, 1960.)

* * * *

SUPER TUNA LONG-LINER LAUNCHED:

The Japanese super tuna long-liner No. 1 Seiju Maru was launched on August 10, 1960, at a Shimizu shipyard. The vessel, built at a cost of about 260 million yen (US\$723,000), was started May 21, 1960, and was scheduled to be completed in mid-September. She has 1,680 cubic meters (59,327 cubic feet) of refrigerated hold space and can carry about 1,000 metric tons of tuna. The No. 1 Seiju Maru is 1,175 tons gross, 67.5 meters (221 feet) long, 11.5-meter (37.7-foot) beam, 5.3 meters (17.4 feet) deep. There is one 150-hp. refrigeration machine and two 100-hp. machines. The main engine is 1,700 hp., giving a speed of 14 knots, and fuel tanks are 510 cubic meters (18,010 cubic feet). (The Suisan Keizai, August 10, 1960.)

* * * *

TUNA FISHING VESSEL SENT TO OKINAWA IN JULY:

The Japanese Fisheries Agency, which some time ago received a request from the Government of the Ryukyus for Japanese tuna vessels, decided as of July 1, 1960, to send on charter to Okinawa three vessels, the No. 13 Kaiko Maru (352 tons gross), the

No. 28 Yusei Maru (194 tons gross), and the Maguroyama Maru (110 tons gross), the latter vessel to be built in Okinawa.

The Ryukyu Government had asked for the chartering of 3,200 gross tons of deep-sea tuna vessels over a 5-year period, as a means of promoting the fisheries of the Ryukyus. After considering the matter, the Japanese Government decided to permit the supplying of vessels up to a limit of 2,250 tons over a 5-year period, and further decided to send 650 tons by the end of the 1960 Japanese fiscal year. The three vessels are the first part of this tonnage to be sent.

The No. 13 Kaiko Maru sailed for Okinawa late in July, and will be taken over by a local company. Tuna caught in the Ryukyus will be imported into Japan up to a limit of 500 metric tons annually. (The Fishing Industry Weekly, July 15, 1960.)

* * * *

TWO MORE TUNA MOTHERSHIPS TO FISH FIJIAN WATERS:

At present two tuna motherships, the No. 3 Tenyo Maru and the Nojima Maru, are operating in the Fiji Islands area. After the wind-up of North Pacific salmon mothership fleet operations, two more ships, the Jinyo Maru and the Koyo Maru were expected to sail for the Fiji area to operate as tuna motherships.

The Jinyo Maru was expected to return to Hakodate on August 5, and arrive at Tokyo before August 10. After unloading salmon, the vessel was to sail for the tuna grounds about August 20. Her fleet will consist of about 50 fishing vessels scheduled to sail from Misaki, and also more than half of the catchers of the Nojima Maru and No. 3 Tenyo Maru fleets will transfer over to this fleet. Planned production is 5,600 metric tons, and the fleet will return to Japan the latter part of November 1960.

The Koyo Maru also was expected to return from salmon fishing about August 5 and to sail for the tuna grounds on August 18. Her fleet of about 60 fishing vessels was expected to arrive on the tuna grounds late in September to take over for the Tenyo Maru, which will return to Japan. The Koyo Maru fleet will fish until next January, when it will again be replaced by the No. 3 Tenyo Maru.

Japan (Contd.):

fleet. The production plan is for 5,600 tons. (The Suisan Keizai, August 4, 1960.)

* * * * *

**FROZEN SALMON SHARK
EXPORTED TO ITALY:**

Large quantities of frozen salmon shark are being exported to Italy as a special product of the Kesenuma area of northeastern Japan. The first inquiries about shark came from Italy to Kesenuma in 1957. At that time the shark was tied in with barter trade for rice and mercury, so the quantity exported to Italy was only 50 metric tons a year, but the product was well received and orders increased rapidly, until this year exports amount to 300 tons. The price of US\$245 per metric ton is as good as that for Atlantic yellowfin tuna.

As a result of this development, the so-called "summer salmon shark," which used to be sold cheap for fish cakes, is now bringing 57 to 58 yen per kilogram (about 7 U. S. cents a pound), twice the usual price in the past, and there are even signs of a shortage in the supply. Kesenuma produces 50 percent of the salmon shark caught off northeastern Japan. (The Suisan Keizai, August 4, 1960.)

* * * * *

**EARNINGS BY CATCHER VESSELS IN
NORTH PACIFIC MOTHERSHIP
SALMON FISHERY:**

The last of the Japanese North Pacific mothership salmon fleets was expected to finish operations August 5 or 6, 1960. Despite the reduction in catch quotas this year, the fishing boats have good earnings because of 20-percent higher salmon prices this year over last year, and because the proportion of reds and chums in the catch was higher than normal. It looks as if the catcher vessels will average 18 million yen (US\$50,040) for the season. In fleets which had a particularly high proportion of red salmon, some vessels have earnings of 21 million yen (US\$58,380). Considering that expenses for outfitting for the season averaged 15 million yen, each catcher vessel is assured a net profit of about 3 million yen (US\$8,340). (The Suisan Tsushin, July 29.)

* * * * *

**NORTH PACIFIC MOTHERSHIP
SALMON FISHERY SEASON ENDS:**

This year's Japanese mothership-type North Pacific salmon fishing has ended. During this year's Japan-Soviet fishery negotiations, the Japanese salmon catch quota was cut by the Soviets from last year's 85,000 metric tons to 67,500 tons. Furthermore, closed areas were enlarged and finally a special area was closed for this year only. The mothership fishery was allocated 54,000 tons of the catch quota as compared with 70,830 tons in 1959, and each fleet's quota was about 4,600 tons.

In addition to this being a year of low abundance of pink salmon, the beginning of the fishing season was delayed by the negotiations. The fleets did not leave Hakodate until May 19 and fishing did not start until May 25. Although the catch quota had been cut, the closing date of the season was set as August 10, and there was some fear that the quota could not be filled by that date because of the expected scarcity of pink salmon. However, fishing was better than expected, and although pinks were certainly scarce, red and chum salmon were abundant. The Japanese salmon fishermen, while admitting that the abundance of Asian pink salmon was at a low level this year, ascribe their poor catches of the species in part to the action of the Japan-Soviet Fisheries Commission in closing some of the best salmon grounds to high-seas fishing and in requiring the use of large-meshed nets, which allow the pink salmon to escape.

According to preliminary estimates by the fisheries trade journals, the total Japanese salmon catch, including that south of the Japan-Soviet treaty area, will be about 120,000 tons as compared with about 154,000 tons in 1959.

The price of salmon was 20 percent over last year's and the boats appear to have done well financially because of their good catches of high-priced red and chum salmon. Even the mothership operators appear to have come through in reasonably good shape, in what was anticipated to be a money-losing season, because of the shorter fishing period.

A total of 12 mothership fleets with 410 catcher boats participated in this year's offshore salmon fishing--4 mothership and 50 catcher boats less than in 1959.

Japan (Contd.):

According to the accounts of the returning fleet personnel, inspection by the Soviets was rather severe. But the Japanese Fishery Agency's patrol boats were also active in citing violators. Seven boats were caught violating regulations. The Soviets had 13 or 14 patrol craft out, and three 500-ton naval vessels. Most fleets seem to have been inspected about seven times. It is reported that especially thorough inspections were made toward the end of the season. (Nippon Suisan Shimbun, August 10, 1960.)

* * * * *

INCREASED ALLOCATIONS FOR SALMON ROE IMPORTS PROPOSED:

The Japanese Ministry of International Trade and Industry has requested the opinion of the Japanese Fisheries Agency on increasing the foreign exchange allocation for imports of salmon roe in the Japanese 1960 fiscal year. The Fisheries Agency was of the opinion that the increase would have no bad effects on Japanese producers. Up to the present, the allocation has been US\$100,000, but if 227 metric tons are to be imported in the 1960 fiscal year, \$165,000 would be required, so the Agency will approve the Ministry's scheduled increase of \$70,000.

For the 1959 fiscal year Japanese coastal production of salmon roe is not known (it was 220 tons in 1958), but the salmon motherships produced 726 tons. (The Suisan Tsushin, August 2, 1960.)

* * * * *

SALMON SHARK EXPLORATORY FISHING OPERATION IN NORTH PACIFIC:

According to word received by the Japanese North Pacific Salmon Predator Research Headquarters, the salmon shark fleet (2 long-liners and 4 gill-netters) operating in the Aleutians area had taken a total of 765 shark as of August 9. Examination of the stomach contents showed that 217 shark, or about 30 percent, had eaten salmon. Some of the sharks examined contained 7 or 8 juvenile salmon. The analysis of the stomach contents is being done by an investigator from the Hokkaido Regional Fisheries Laboratory.

The objective of the predator survey fleet is to provide data for the Japanese delega-

tion in the next fisheries conference with the U. S. S. R. However, Japanese fishing industry circles doubt that the expedition will produce results commensurate with its cost of 60 million yen (US\$167,000), which is equivalent to the operating costs of a salmon mothership fleet.

According to the North Pacific Mothership Association, in spite of the number of shark taken, there seems to be little likelihood of the survey's producing important data to show how much salmon is being consumed by predators and what the effect of this is on the salmon resources. In this view, the only real result of the investigation is to show where salmon shark occur most abundantly. (The Suisan Keizai, August 12, 1960.)

* * * * *

BRISTOL BAY FISH-MEAL FACTORYSHIP PRODUCTION AS OF JULY 31:

As of July 31, 1960, the Japanese fish-meal factoryship fleets in Bristol Bay had produced a total of 30,346 metric tons of fish meal. It is expected that they will meet their total production goal of 50,000 tons in the latter part of October. In addition, the fleets have produced solubles, fish oil, salt cod, and a reported total of 13,816 tons of "frozen products." (The Suisan Keizai, August 2, 1960.)

* * * * *

FISH MEAL PRICES:

The production cost of Japanese factoryship fish meal during the period when loans are being paid off is about US\$157 a metric ton. After the loans are paid off, it will be \$132 a ton. The 1958 production was all exported at \$171, but only about 40 percent of the 1959 production was exported at \$172 a ton.

These data were revealed in a study of the world fish-meal situation from the Japanese point of view. The study, made by the Japanese Ministry of Agriculture and Forestry, pointed to the low price of Peruvian fish meal. The study apparently concludes that, while continuing efforts to develop export markets, the meal will have to be sold domestically in some way that will not hurt too badly the small producers of crude meal in Japan.

The study also contains some projections to 1969, when it is estimated that Japan's requirements will be equivalent to 882,000 tons of raw fish.

* * * * *

Japan (Contd.):

FACTORYSHIP FISH MEAL TO BE SOLD ON DOMESTIC MARKET:

The Japanese Fisheries Agency has for some time been considering the advisability of permitting fish meal produced on Japanese factoryships to be sold on the domestic market in Japan. The Agency in mid-August was expected to announce that such meal may be sold domestically under limitations as to quantity and price. On August 9 the authorities called in a representative of the Saury Council and the Fisheries Agency's Production Division tried to persuade him to accept this decision. The chief of the Agency's Products Section stated that release of the factoryship meal on the domestic market would be permitted as soon as the understanding of the various groups concerned was obtained.

It is certain that the factoryship fish meal cannot be exported because of the softening of the world market, and it is clear that there is no way to overcome the situation but to sell the meal domestically at a price that will not be below cost. The domestic groups concerned, although opposed to domestic sale of the meal, are asking that if it must be sold domestically, it be released at such time as to avoid conflict with the saury season. It is expected that the Fisheries Agency will release about 15,000 metric tons, at an estimated price of 53,000 or 54,000 yen (about US\$150 a ton).

During the budgeting of foreign exchange allocations for the second half of the year, the Animal Husbandry Bureau strongly urged the Ministry of International Trade to make an allocation for the import of Peruvian fish meal, but the Fisheries Agency has opposed this, claiming that emergency imports can be made if necessary. The matter is still under negotiation. (The Suisan Tsushin, August 10, 1960.)

* * * * *

FISHING COMPANIES PLAN TO RAISE POULTRY AND LIVESTOCK:

Three of the largest Japanese fishing companies are planning to establish livestock and poultry farms in Kanagawa Prefecture. One of the companies has already begun construction of a large livestock farm at Atsugi City where some 350,000 chickens, hogs, and cows will be raised. At the same

time, the company is planning a feed factory at the newly-reclaimed Daikoku-cho section of Yokohama. Following this example, the other two fishing companies are both planning to build poultry farms at Sagamihara and feed factories at Daikoku-cho. The primary reason, is the steadily decreasing amount of fish being caught by mainland Japanese fishermen. Also, there is an acute fear among the Japanese companies that the restrictions placed upon Japanese fishermen by other countries, principally Russia and Korea, will become greater, thus further decreasing the annual fish catch.

Chicken-raising on a modest scale has proved successful in Japan previously and the fishing companies are apparently planning to have a portion of their stock raised by independent farmers as well as maintaining their own large farms. These announcements have stirred an interest among the present feed-producing companies in the Yokohama-Kawasaki area. One of the largest feed companies in the district has already announced plans to increase its capacity by expanding its present plant in August and five smaller firms in the area are studying similar expansion programs. This development should expand the market for fish meal in Japan as large quantities are used in poultry and hog rations. (United States Consulate in Yokohama, July 14, 1960.)

* * * * *

KING CRAB MOTHERSHIP RETURNS FROM BRISTOL BAY AFTER FILLING QUOTA:

The Japanese king crab mothership Tokei Maru (5,385 gross tons), which is jointly operated in Bristol Bay by three large Japanese fishing companies, returned to Hakodate on July 19, 1960, with three of her catcher vessels. The fleet operated with good success for a period of 79 days, and the 80,000-case canned crab meat quota was filled in two days less than last year. The fleet commander stated that the catch rate averaged 17.3 crabs per unit of tangle net, 0.9 crab higher than last year.

The United States fleet appeared to have completed 80 to 90 percent of its fishing before the Tokei Maru fleet reached the grounds. The Soviet fleet was operating on the grounds before the Tokei Maru arrived, and is thought to be still fishing there. As for the prospects for the resource, the fleet commander thought it would be all right with the present single

Japan (Contd.):

Japanese fleet operating, but that two fleets would be too much. (Hokkai Suisan, July 25, 1960.)

* * * * *

HERRING-CRAB FACTORYSHIP REPORTS GOOD CATCHES IN BERING SEA:

The Shinyo Maru, operated by a Japanese firm this year as the first Bering Sea combination herring and frozen crab factoryship, had as of July 20, 1960, produced about 900 tons of frozen herring. At first the herring were small, but in July large 6- and 7-year old fish were taken at the rate of about 25 tons a day.

As of July 18, the fleet had also produced 6,179 cases of frozen king crab. In addition, the operation had produced 309 metric tons of flounder, 57 tons of cod, 11 tons of arrow-toothed halibut, 252 tons of rockfish, and 29 tons of other species. (The Suisan Keizai, July 21 and July 22, 1960.)

* * * * *

SIX FACTORYSHIPS TO FREEZE FLATFISH IN NORTH PACIFIC:

The 1960 season for the Japanese factoryship flatfish fishery in North Pacific waters began in August, and it was decided that this year six freezerships will participate--Kyokuzan Maru, Otsu Maru, Miyajima Maru, Kashima Maru, Chiyo Maru, and Eijin Maru. Three of these fleets completed operating plans, and applications for fishing permits were made to the Japanese Fisheries Agency. The plans are as follows: Kyokuzan Maru will employ 8 trawlers from the ports of Kushiro and Nagasaki. The factoryship expected to sail from Yokohama on August 20, and planned production is 4,450 metric tons.

The Miyajima Maru fleet, with 5 trawlers, expected to sail at the end of August and planned to produce 4,500 metric tons. The Kashima Maru, with 10 trawlers, expected to sail early in September to fill a production plan of 5,000 tons. The Otsu Maru fleet, with 10 to 12 catcher boats, will produce about 7,000 tons. The Chiyo Maru, sailed about August 20 with 8 fishing boats, and will produce 5,000 tons. The Eijin Maru fleet's plan is similar to that of the Chiyo Maru.

There is some uneasiness about the ability of some of the fleets to fill their production plans, as they will be fishing the same grounds exploited by the fish-meal factorship fleets. The fish-meal fleets are taking about 300,000 tons of fish to produce their 50,000 tons of meal, and the frozen flatfish fleets will be taking about 30,000 tons of fish. Even if they fill their production quotas, there is some concern about the effect on the market. This year 3 of the fleets will fish the Bering Sea and 3 the Sea of Okhotsk. It is considered that 6 fleets is about the limit from the point of view of what the resource will support. (The Suisan Keizai, August 5, 1960.)

* * * * *

SARDINE CANNERS MAY HAVE TROUBLE MEETING CONTRACTS:

Japanese sardine canners have been awarded bids for 23,250 cases by the Philippine National Sales Company (NAMARCO), and an additional 26,750 cases conditioned on ability to produce. Shipment must be made within 45 days after credit is established. But as of late July, the Japan Sea coast was not producing sardines at all, and if this condition continues into September, the contracts cannot be honored.

The four trading companies had to give NAMARCO 20-percent security money, and if they cannot fill the contracts, this will be forfeited. If none of the contract can be filled, the canners will have to pay about 13 million yen (about US\$36,100) in penalties. However, if the canners don't care what price they pay for raw material, they can pack about 10,000 cases.

* * * * *

FISH CONSUMPTION SURVEY SHOWS TRENDS OF FOOD PREFERENCES:

Some interesting trends in Japanese food preferences are pointed up in a study ("A Survey of the Consumption of Fishery Products") published by the National People's Livelihood Research Association.

In five cities of Japan, 1,910 high-school girls were asked whether they preferred to eat meat and fowl, fish, or whale meat. Of those surveyed, 84.7 percent preferred meat and fowl, and only 22 percent said they liked fish. Only 2.2 percent of the girls expressed a liking for whale meat, and 1.8 percent re-

Japan (Contd.):

plied that they liked neither meat, fish, nor whale.

The study pointed out that the retail price of fresh fish in Japan is by no means low, being higher on the average than in such western European countries as Norway, the Netherlands, and West Germany. Although the Japanese consume more fish per capita than any other people in the world, their consumption of animal protein is the lowest of 26 leading countries. It was found that the high-school girls covered by the survey showed a trend in preference away from traditional Japanese cooking methods in favor of European-style cuisine. (Nippon Keizai Shimbun, July 31, 1960.)

* * * * *

MACKEREL FISHERMEN CHANGE TO "PORGY" LONG-LINING IN MARSHALL ISLANDS:

There are 24 mackerel pole-and-line fishing vessels in Nagasaki Prefecture, Japan, which have given up fishing in the peak of the season because the distance to the fishing grounds has become too great, and because the heavy catches made by seiners lately have pushed the price of mackerel down to where a pole-and-line vessel cannot make money. These vessels are working as carriers for the seiner fleet or are switching over to long-lining for "porgy" (yellow sea bream).

The owners of the pole-and-line vessels have asked the Fisheries Agency for licenses for lift-net fishing, when the time comes for issuance of new licenses in September 1960, but the hopes for getting these licenses are not bright. Therefore, they are resolving to outfit four vessels of 70 to 80 tons gross as "porgy" long-liners around October 1960 and begin fishing around the Marshall Islands. In this area fish resembling Japanese sea bream and weighing 4 to 6½ pounds each can be caught. An exploratory fishing vessel from Oita Prefecture has already tried this once and had good success. (Nippon Suisan Shimbun, August 1, 1960.)

* * * * *

OVERSEAS FISHERY OPERATIONS AS OF JULY 1960:

According to a summary of information on Japanese overseas fishery operations by

the Japanese Fisheries Agency, there are a total of 57 ventures, using 102 fishing vessels and 2,438 men. In Central and South America there are 16 operations, mainly trawling and tuna fishing, employing 39 vessels and 821 men. In Southeast Asia there are two ventures, using 24 vessels and 487 men. In the Mediterranean, Australia, and elsewhere there are 20 operations with 39 vessels and 1,130 men.

By type of fishery, the largest category is trawling, with 21 ventures employing 34 vessels. Tuna fishing operations, in Central and South America, Samoa, and elsewhere, total 18, with 47 vessels. There are 11 pearl-culturing and shell-gathering ventures in Burma and Australia, one whaling operation in Brazil, one mackerel fishing venture, one bottom gill-net operation, and three programs for technical assistance to coastal fisheries. The ventures in Central and South America are mainly by large-capital enterprises, while those in Southeast Asia and other areas are principally by medium and small operators, with some participation by big companies. (The Suisan Tsushin, July 30).

* * * * *

SOVIETS OBSERVE JAPANESE FISHERIES CLOSELY:

The Japanese Fisheries Agency inspector who recently returned from the west Kamchatka crab fishing grounds aboard the mothership Yoko Maru has reported that the Russians are diligently studying the fishery situation and are most assiduous in their efforts to find out about the Japanese situation. According to his report, the Soviets do not change inspection personnel every year, as the Japanese do. They assign the same specialists permanently, and these inspectors study their subject very hard and have a detailed knowledge of the situation, appearing to be much concerned about the future. They are not only interested in Japanese fishing, but show a strong interest in the political side and ask many questions on every subject from personnel to policies.

The Russians use cotton nets and are backward in technique, so they want to know everything about Japanese fishing technology. The Soviet fishermen, seeing the difference between their catches and the Japanese, accuse the Japanese of violating regulations. When the Japanese assert that they have stayed on the prescribed grounds, the Russians say the Japanese charts are incorrect. As a matter

Japan (Contd.):

of fact, it appears that the Soviet charts are more accurate, because they are plotting the ships' position by radar, while the Japanese, who use celestial navigation, apparently do make mistakes. However, when the Japanese ask to see the Soviet plotting charts, they will not show them. The only way to persuade them that the Japanese ships are not off limits is to take celestial observations together. (The Suisan Keizai, July 27, 1960.)

* * * * *

TRAWLERS FIND GOOD FISHING OFF FOREIGN COASTS:

The trawling operations conducted off Africa, New Zealand, and Australia by a large Japanese fishing company from its Shimonoseki base are going well in all areas. Off northwest Africa nearly 1,000 cases of snapper are caught per day's fishing. Of the company's two 1,500-ton trawlers which are working off Africa, the No. 62 Taiyo Maru is scheduled to return to Shimonoseki September 15, 1960, with about 1,000 tons of frozen fish. The No. 63 Taiyo Maru will remain longer in the area, returning to Japan at the end of next January. Therefore the No. 63 Taiyo Maru's catch will be shipped to Japan by freighter, the first shipment being expected at Yokohama in mid-September.

The No. 3 Taiyo Maru (500 tons gross), which has been operating off northern Australia, has completed fishing on her 5th voyage, and was expected to return to Shimonoseki on August 13 with 16,000 cases of fish. Ever since the first trawler sailed to that area in August 1959, landings have been good on every trip. At present it has become a regular routine to take 32 days for the round trip to and from the grounds, and to fill the ship in 30 days of fishing.

The New Zealand grounds also continue to offer good fishing, and the company's three trawlers which operate there, the 750 gross tons Nos. 56 and 57 Taiyo Maru and the 1,490 gross ton No. 61 Taiyo Maru, are continuing profitable operations, taking catches which run steadily about 60 percent snappers. In August, the No. 61 Taiyo Maru was expected to return to its base with about 1,000 metric tons of fish, having completed a total of 8 trips.

With most of the company's trawlers either working distant grounds or acting as

carriers for the North Pacific fisheries, the company now has only three trawlers still assigned to the East China Sea, and as two of those were in dock during July, there was only one fishing the nearby Japanese grounds. (Nippon Suisan Shimbun, July 25, 1960.)

* * * * *

NORTH PACIFIC WHALING OPERATIONS, JULY 1960:

The Japanese North Pacific sperm whaling fleet (No. 2 Zunan Maru) completed its catch quota of 1,600 whales on August 1, 1960, after a 2-months voyage. As of that date the baleen whale fleet (Kyokuyo Maru) had taken 689.83 blue-whale units, out of a quota of 800. Production as of August 1 for the No. 2 Zunan Maru was 12,924 metric tons of sperm oil, 4,384 tons of frozen meat, 1,989 tons of salted meat, and 109,511 pounds of liver oil. For the Kyokuyo Maru it was 9,108 tons of baleen whale oil, 16,489 tons of frozen meat, 537 tons of salted meat, and 93,735 pounds of liver oil. The meat is expected to sell for about the same as last season's Antarctic production, 85,000 yen (US\$236) a metric ton.

* * * * *

WHALING INDUSTRY FAILS TO AGREE ON USE OF FORMER BRITISH FLEET:

On August 1, 1960, Japanese Fishery Agency officials met with representatives of the three Japanese Antarctic whaling companies and the Whaling Association to try to work out an acceptable arrangement for the addition of the recently-purchased British Balaena whaling fleet. The conference ended in failure as the Japanese purchasers of the Balaena fleet will accept no special conditions limiting operations, and the other two whaling companies refuse to accept her on the Antarctic grounds on an equal basis with the present six fleets. (The Suisan Keizai, August 2, 1960.)



Liberia

MARITIME AND INLAND FISHING REGULATIONS PUBLISHED:

The Liberian Department of Agriculture and Commerce has published the first detailed Maritime and Inland Fishing Regulations to go into effect in Liberia. These regulations establish mandatory license fees, authorize the Bureau of Fisheries to prohibit

Liberia (Contd.):

fishing gear harmful to fishing resources, to close any fishing zone because of overfishing, establish mesh regulations, and require monthly reports from the commercial fishing industry. (United States Embassy in Monrovia, August 5, 1960.)



Mexico

SHRIMP FISHERY TRENDS,
EARLY AUGUST 1960:

A sudden drop in ex-vessel shrimp prices, reopening of negotiations between boat owners and cooperative fishermen, and a late rainy season were among the noteworthy developments in Mexico's shrimp fishing industry during late July and early August 1960.

On August 4, following lower prices in the United States shrimp market (reportedly due to heavy shrimp landings in Texas), Mexican ex-vessel prices at Carmen-Campeche dropped from 11 to 19 U. S. cents a pound. The sizes most heavily hit were 21-35 count, which dropped 16 cents for 21-25 count, 19 cents for 26-30, and 18 cents for 31-35. The smallest drop (11 cents) was for 51-65 count. The remaining size categories dropped 13 cents a pound. The drop in ex-vessel prices was not so sharp on the Mexican west coast. Prior to August 4, ex-vessel prices at Salina Cruz had averaged 10-26 cents a pound lower than those quoted at Carmen-Campeche.

Ex-Vessel Shrimp Prices at Carmen-Campeche and Salina Cruz, August 4, 1960			
Size Count Per Pound	Carmen-Campeche (All Species)		Salina Cruz (Brown Only)
	Independent Vessels	Nonindependent Vessels	
..... (U. S. Cents a Pound)			
U/15	68	63	50
15/20	63	63	50
21/25	55	50	42
26/30	47	43	35
31/35	41	39	-
31/40	-	-	26
36/40	36	34	-
41/50	31	29	21
51/65	26	24	-
51/over	-	-	16

The shrimp fishery out of Salina Cruz in early August was in the slack season. The vessels were reported to be averaging around 3,300 pounds for a 12-day trip.

Since the beginning of the closed season on July 16 along the west coast areas of Sonora-Sinaloa, the Guaymas and Mazatlan boats that are still operating have switched to the west coast of Baja California. The trawling season in the Sonora-Sinaloa area was expected to reopen in mid-September.

Carmen-Campeche landings in July improved slightly over those for June. Carmen landings averaged around 1,700 pounds per trip while those for Campeche were about 1,500. The run of white shrimp in this area which started in mid-June passed its peak during the first week in July. Landings at Carmen during the first week of July averaged over 50 percent whites. For the remainder of the month

whites accounted for about 30 percent of the landings. At Campeche whites dropped from about 10 percent during the first week to less than 5 percent for the rest of the month. For the month Carmen landings averaged about 50 percent pink and those for Campeche were about 90 percent pink.

Carmen shrimp landings, as usual, were of smaller size than those for Campeche. About 40 percent of the shrimp landed at Carmen were 30 count and under, whereas about 70 percent of the Campeche landings were in this size group.

Negotiations between boat owners and cooperative fishermen on the price of shrimp for the 1960/61 season were resumed late in July. The deadline was August 13 and unless an agreement was reached or another extension arrived at by that date, a tie-up on the part of the fishermen was probable.

The late rainy season along the coasts of Sinaloa and Sonora is likely to produce a smaller crop of shrimp than that of the previous two years—which were record ones for that area. As late as July 15 great expanses of nursery-ground areas were still not covered by water. (United States Embassy in Mexico City, August 15, 1960.)

* * * * *

FISHERY PRODUCTS REQUIRING
IMPORT LICENSES:

Effective June 4, 1960, Mexico has added certain fishery products to the list of products requiring a prior import license from the Ministry of Industry and Commerce. The fishery products included in the list are: (1) crustaceans and mollusks, fresh, chilled, or frozen not specified; (2) preserved tuna, herring, shrimp, crayfish, mackerel, and oysters in airtight containers; and (3) preserved salmon and sardines in airtight containers, weighing with the immediate container up to 5 kilograms (about 11 pounds), provided containers are labeled to indicate contents.

The list of fishery products requiring prior import licenses now includes canned shrimp and other canned fish and shellfish. Smoked, dried, cooked, or salted shrimp were listed prior to the additions made effective by the June 2 regulation.

* * * * *

IMPORT PERMIT FOR
FISH MEAL REQUIRED:

Effective July 15, 1960, fish meal imported into Mexico was placed on the list of articles subject to prior import permits from the Ministry of Industry and Commerce. This restriction includes the free zones and perimeters of the country.

The purpose of this action is to assure that Mexican-produced meal will be utilized before permits will be granted to import foreign meal. It is reported that before this

Mexico (Contd.):

order was issued sanitary permits had been granted for the importation of about 15,000 tons of fish meal (mostly from Peru) since the first of the year. (United States Embassy in Mexico City, August 5, 1960.)

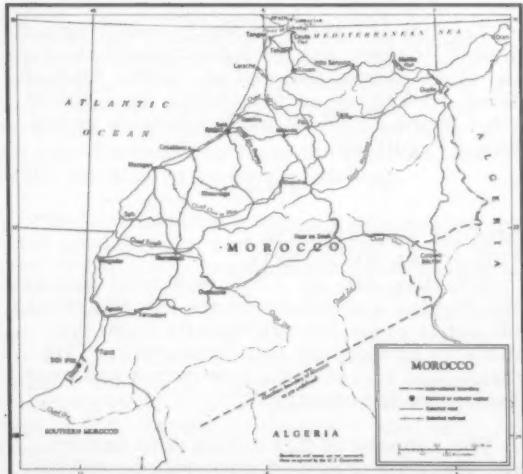


Morocco

FISHERIES TRENDS, APRIL-JUNE 1960:

The Moroccan Central Committee for Marine Fishing met in April of this year to study the problems of fishing in Morocco and to draw up recommendations for presentation to the Government. The subcommittee which examined the status of coastal fishing recommended that construction be begun on trawlers with more powerful motors so that the fishing fleet could keep abreast of the demands of the market. The committee also recommended that studies be begun of the eventual construction of a Moroccan deep-sea fishing fleet. The subcommittee also recommended that the port of Mehdia (Kenitra) be rebuilt because of its location near the most productive fishing banks.

Export figures for canned sardines were announced during the second quarter. The fish-canning industry, which was pessimistic at the beginning of 1960, is now optimistic. The final export total of canned sardines for



1959 was 29,906 metric tons as compared with 26,468 tons in 1958. France was the largest importer of Moroccan canned sardines (12,475 tons, an increase of 60 percent over 1958). Other large importers were West Germany (5,399 tons, up from 2,500 in 1958); British territories in Africa, 1,839 tons; and French territories in Africa, 2,050 tons. The United States imported 885 tons of canned sardines from Morocco in 1959.

Exports of canned fish for the first four months of 1960 showed an increase over the same period of 1959. *La Vie Economique* of May 20, 1960, without giving specific figures, stated that France remained the principal importer, the devaluation of the "Moroccan franc in October 1959 having enabled Morocco to place its canned fish products on the French market at an advantageous price." Following are comparative export figures for the first four months of 1958, 1959, and 1960:

Canned Product	1960	1959	1958
<i>(Metric Tons)</i> ..			
Sardines	6,900	7,000	7,100
Tuna	410	350	600
Other	1,750	650	130
Total	9,060	8,000	7,830

The Federation des Industries de la Conserve au Maroc (the Moroccan Canner's Association) signed a contract during the April-June 1960 quarter with the Soviet Union to deliver 65,000 cases of sardines from this year's catch. In 1959, the canner's association agreed to send 35,000 cases to the Soviet Union, but it was unable to deliver more than 15,000 cases since the contract was not signed until too late in the year.

The fish-canning industry is satisfied with the progress of the 1960 fishing season. The supply of fish has been more than adequate, and, there being no serious labor difficulties, no difficulty is foreseen in meeting the demands of the market. In this connection it has been noted that the earthquake at Agadir in February has not affected the supply of fish in Moroccan waters. It was feared that the earthquake might in some way have upset the natural balance of marine life in that area. The good run of fish this year and studies of the ocean floor, which revealed no major changes, have laid these fears to rest. (United States Embassy, Rabat, July 15, 1960.)



Netherlands

WITHDRAWAL FROM WHALING CONVENTION APPROVED BY PARLIAMENT:

The Netherlands Second Chamber of Parliament on July 13, 1960, passed a bill endorsing Dutch withdrawal from the International Whaling Convention. The actual withdrawal took place in the summer of 1959 after the Whaling Commission had refused to grant the Dutch whaling fleet 8 percent of the 15,000 blue-whale units set as the season's maximum total Antarctic pelagic catch. The Minister of Agriculture and Fisheries stated that in fact the Dutch whaling fleet had caught only 6.7 percent of the total number of blue-whale units in the 1959/60 season, while in the previous season it had caught slightly over 6.7 percent of the quota for that season. (United States Embassy in the Hague, July 15, 1960.)

* * * * *

TWO BILLS ON WHALING PASSED BY SECOND CHAMBER OF PARLIAMENT:

On July 13, 1960, the Second Chamber of the Netherlands Parliament approved two bills concerning whaling. The First Chamber, however, adjourned on July 26 without considering them, so their enactment could not take place until after the First Chamber reconvened on September 13.

The first bill, consisting of only two articles, ratifies the Netherlands' withdrawal from the International Whaling Convention, 1946. (Netherlands withdrew from the Convention effective June 30, 1959.) The second bill prohibits the taking of whales by Dutch vessels without a permit from the Ministry of Agriculture and Fisheries and provides that the issuance of permits shall be subject to regulations designed to protect whale stocks and to further scientific research in this field. The regulations are to be issued by the Minister of Agriculture and Fisheries and may be repealed or amended by him. A procedure for appealing against the Minister's decision is also provided.

The bill concerning Netherlands' withdrawal from the International Whaling Convention is intended merely to ratify action already taken by the Netherlands Government. Should the Government decide in the future to re-adhere to the Convention, it could presumably do so on its own initiative

and then subsequently seek Parliamentary approval, just as it is now seeking such approval for its withdrawal.

The intention of the second bill is to give the Government legal competence to regulate whaling by Dutch vessels, since Dutch whaling is no longer subject to the provisions of the International Whaling Convention or to the regulations of the International Whaling Commission. In explaining the provisions of the bill to the Chamber, Minister of Agriculture Marijnen stated that the Government considers it its duty to cooperate in conserving whale stocks, but he indicated that for the time being there would be no regulations limiting the size of catches or fixing the opening and closing dates of the whaling season.

Debate on the two bills was largely limited to statements by a Socialist member of Parliament known for his interest in conservation. He strongly attacked the Government's withdrawal from the Convention as a coercive measure which did not reflect to the Netherlands' credit in international affairs and characterized the regulations proposed by the Government under the second bill as inadequate for the conservation of whale stocks. (United States Embassy in the Hague, August 1, 1960.)



Norway

FISH MEAL AND OIL INDUSTRY:

Production of fish meal in Norway is based mainly on herring and waste from the fish-filleting plants. As the demand from the rapidly expanding mink farms for filleting plant waste has been increasing, less waste has been available for fish meal. The prices paid by the mink farms for fish waste are substantially higher than those which the fish-meal industry

Table 1 - Norwegian Production of Fish Meal and Oil, 1958-1959

Product	1959	1958
Fish Meal:		
Herring meal	110,000 2/	100,000 18,900
Other fish meal/		
Total	110,000	118,900
Fish Oil:		
Cold-cleared cod-liver oil	15,900	11,900
Other fish-liver oil	1,400	4,800
Herring oil	40,000	34,000
Total	57,300	50,500

1/ Production of solubles included.

2/ Not available.

Norway (Contd.):

try can afford to pay. Norwegian winter herring are therefore the principal raw material for reduction into fish meal. The average ex-vessel price for herring in 1959 was 25.75

kroner per hectoliter (1.8 U.S. cents a pound) compared with 21.78 kroner per hectoliter (1.5 cents a pound) in 1958.

Table 2 - Norwegian Exports of Fish Oils, 1958-1959

Product and Destinations	1959	1958
	(Metric Tons)	
	625	240
Raw Herring Oil: Total		
Cold-Cleared Fish-Liver Oil:		
Finland	115	126
Yugoslavia	-	48
Czechoslovakia	571	720
East Germany	-	40
Spain	-	60
Greece	-	90
Italy	-	107
Switzerland	-	60
West Germany	155	185
Austria	58	59
Turkey	440	111
Belgium and Luxembourg	-	40
France	-	72
Netherlands	301	335
Canada	-	11
United States	729	642
Mexico	-	69
Brazil	167	180
Colombia	73	31
Peru	-	25
Indonesia	-	34
Israel	-	59
Others	1,514	579
Total	4,123	3,683
Veterinary Fish-Liver Oil:		
Finland	151	173
Italy	545	522
Switzerland	477	534
Sweden	1,448	1,112
Austria	144	154
Belgium and Luxembourg	-	67
Great Britain	101	-
Denmark	1,353	746
Netherlands	147	160
Mexico	-	130
Brazil	106	125
Peru	-	31
New Zealand	56	49
Hong Kong	138	-
Others	836	460
Total	5,503	4,263
Other Fish-Liver Oil:		
Poland	503	506
Czechoslovakia	1,947	4,407
Spain	594	744
Italy	400	740
Sweden	133	185
West Germany	2,158	772
Austria	-	109
Belgium and Luxembourg	-	197
Denmark	-	25
France	137	218
Netherlands	226	161
Great Britain	72	92
United States	-	241
Mexico	260	293
Brazil	465	215
Israel	75	27
Others	1,712	974
Total	8,772	9,906

During 1957 production of fish solubles was slightly above 2,000 metric tons. Production has been declining since 1957 and it is now negligible. The reason is that the market price for solubles has been low. The reduction plants have found it more advantageous to mix the solubles with the meal, thereby raising the meal's protein content.

The average prices to the principal export markets as of March 1960 were as follows:

Product	US\$ a Metric Ton
Fish (herring) meal	131
Fish (herring) oil	48

There are approximately 70 reduction plants in Norway with a capacity of approximately 37,200 metric tons per day of raw material.

Imports of raw herring oil amounted to 39,478 tons in 1959 as compared with 6,632 tons in 1958. No other fish body oils were imported.

With a few exceptions, marine oils may be imported free of duty. There is no duty on the following: crude whale oil, crude sperm and bottlenose oil, crude herring oil, crude seal oil, shark-liver oil, and all fish-liver oils. The rate of duty on marine fats, including spermaceti, is 0.16 kroner per kilogram (1 cent pound).

All types of marine oils are free of import restrictions except refined fats and refined oils which are subject to import licensing by the Ministry of Commerce. (United States Embassy, Oslo, July 12, 1960.)

* * * * *

EXPORTS AND IMPORTS OF MARINE OILS AND THEIR PRODUCTS; EXPORTS OF HERRING MEAL, 1959:

In 1959, Norwegian imports of all types of marine oils and byproducts amounted to 56,548 metric tons, valued at almost US\$11.0 million. Imports of marine oils exclusively, amounted to 56,547 tons--12,333 tons, or 21.9 percent, of the total was imported from the United States (table 1).

The same year, Norwegian exports of all types of marine oils and byproducts amounted to 186,265 tons, valued at US\$40.9 million, of which 757.3 tons, or 0.5 percent were exported to the United States (table 2). The amount of marine-oil exports to the United States may have been greater, but the exact amount cannot be ascertained because certain categories of exports do not show country-of-destination detail.

The United States was the principal buyer of medicinal cod-liver oils, and also bought some residual fish-liver oils.

Norwegian exports of herring meal in 1959 amounted to 71,101 tons, valued

Table 1 - Norwegian Imports of Marine Oils and Their Products, 1959

Type	Country of Origin	Metric Tons	1,000 Kr.	1,000 US\$
Whale Oil, Crude:	United Kingdom	5,429.5	8,565.4	1,200.0
	Japan	2.7	13.9	1.9
	Total	5,432.2	8,579.3	1,201.9
Sperm and Bottlenose Oil:	Peru	50.1	58.1	8.1
	Total	50.1	58.1	8.1
Herring Oil, Crude:	United States	12,110.2	15,393.5	2,156.5
	Denmark	5,909.3	7,387.0	1,035.0
	Sweden	1,860.5	2,086.9	292.3
	United Kingdom	2,112.8	2,499.5	350.1
	West Germany	15,063.8	19,639.1	2,751.3
	Iceland	1,274.9	1,614.6	226.1
	Portugal	371.3	353.7	49.5
	Morocco	100.1	135.1	18.8
	Portuguese W. Africa	180.2	170.3	23.9
	Others	495.3	472.3	66.8
	Total	39,478.4	49,752.0	6,970.3
High Potency (Vitamin A), Fish-Liver Oil:	United States	43.1	1,560.7	218.7
	Netherlands	12.3	279.3	39.2
	Union of S. Africa	792.3	1,976.5	276.9
	Japan	106.7	2,436.3	341.3
	Canada	5.4	169.5	23.7
	Others	1.5	2.4	0.3
	Total	961.3	6,424.7	900.1
Medicinal Cod-Liver Oil:	Denmark	511.6	784.8	110.0
	Total	511.6	784.8	110.0
Veterinary Fish-Liver Oil:	Denmark	-	0.1	1/
	West Germany	0.1	0.7	1/
	Total	0.1	0.8	-
Industrial and Mixed Fish-Liver Oil, Pale:	France	17.0	23.1	3.2
	United Kingdom	56.5	77.2	10.8
	Iceland	4,992.3	6,950.1	973.8
	Peru	353.1	331.1	46.4
	Others	0.5	0.8	0.1
	Total	5,419.4	7,382.3	1,034.3
Industrial and Mixed Fish-Liver Oils, Red	Iceland	1,579.7	2,188.4	306.6
	Peru	125.0	126.3	17.7
	Others	0.4	0.9	0.1
	Total	1,705.1	2,315.6	324.4
Residual Fish-Liver Oils:	United States	179.5	98.6	13.9
	Sweden	1,446.0	736.1	103.1
	West Germany	573.9	304.2	42.6
	Total	2,199.4	1,138.4	159.6
Refined Marine Oil Edible:	Iceland	50.0	60.1	8.4
	Total	50.0	60.1	8.4
Other Marine Oils:	Denmark	25.8	26.3	3.8
	West Germany	200.1	1,105.6	154.8
	Union of South Africa	4.8	107.4	15.0
	Japan	3.6	190.0	26.6
	Peru	505.2	480.5	67.2
	Total	730.5	1,909.8	267.5
	Total Marine Oils	56,547.1	78,406.4	10,984.7
Refined Marine Fats:	Sweden	0.9	1.6	0.2
	Total	0.9	1.6	0.2
Other Marine Fats:	West Germany	-	0.1	1/
	Total	-	0.1	-
Spermaceti, Crude, Pressed or Refined:	West Germany	0.3	1.7	0.2
	Total	0.3	1.7	0.2
	Grand Total	56,548.3	78,409.8	10,985.1

1/Less than US\$100.

Norway (Contd.):

Table 2 - Norwegian Exports of Marine Oils, and Their Products, 1959

Type	Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000
Whale Oil, Crude	Total	92,719	131,421	18,412
Sperm and Bottlenose Oil, Crude	Total	13,408	14,890	2,086
Seal Oil, Crude:	Finland	13	22	3
	Sweden	4	7	1
	France	196	304	43
	Italy	5	7	1
	Netherlands	2	3	1/
	West Germany	3,016	4,069	570
	Others	12	22	3
	Total	3,248	4,434	621
Herring Oil, Crude:	Italy	18	22	3
	Czechoslovakia	94	94	13
	West Germany	465	488	68
	Austria	21	25	4
	Australia	27	36	5
	Total	625	665	93
Medicinal Cod-Liver Oil:	United States	729	1/ 1,552	217
	Finland	115	354	50
	Netherlands	301	592	83
	Czechoslovakia	571	1,193	167
	Turkey	440	1,061	149
	West Germany	155	357	50
	Brazil	167	335	47
	Others	1,691	3,582	502
	Total	4,169	9,026	1,265
Veterinary Cod-Liver Oil:	Denmark	1,353	2,244	314
	Finland	515	306	43
	Sweden	1,449	2,226	312
	Italy	545	825	116
	Netherlands	147	244	34
	United Kingdom	101	159	22
	Switzerland	477	715	100
	Austria	144	229	32
	Hong Kong	138	237	33
	Brazil	106	164	23
	Others	528	1,559	218
	Total	5,503	8,908	1,247
Residual Fish-Liver Oils:	United States	28	21	3
	Denmark	9	8	1
	France	53	35	5
	Italy	79	87	12
	Spain	32	38	5
	United Kingdom	78	53	7
	West Germany	223	124	18
	Brazil	86	102	14
	Mexico	104	114	16
	Others	11	12	2
	Total	703	594	83
Marine Oils, Refined, Edible:	Denmark	158	287	40
	Sweden	77	146	20
	France	231	457	64
	West Germany	406	695	97
	Panama	140	257	36
	Others	14	26	4
	Total	1,026	1,868	261

1/ Less than US\$1,000.

(Continued on the following page.)

Norway (Contd.):

Table 2 - Norwegian Exports of Marine Oils, and Their Products, 1959 (Continued)

Type	Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000
Marine Oils, Refined, Inedible:	Sweden	41	76	11
	France	375	588	82
	Italy	245	374	52
	Spain	303	523	73
	Switzerland	27	44	6
	Czechoslovakia	950	1,316	184
	West Germany	37	61	9
	Austria	35	70	10
	Brazil	264	424	59
	India	22	35	5
	Israel	13	23	3
	Pakistan	15	22	3
	Others	32	65	9
	Total	2,359	3,621	506
Other Fish-Liver Oil, Except Residual and Brown Oil:	Sweden	133	387	54
	France	137	382	54
	Italy	490	720	101
	The Netherlands	226	1,016	142
	Poland	503	708	99
	Spain	594	1,069	150
	United Kingdom	72	1,296	182
	Czechoslovakia	1,947	2,921	409
	West Germany	2,158	2,920	409
	Israel	75	317	44
	Mexico	260	372	52
	Brazil	465	697	98
	Others	1,712	2,764	387
	Total	8,772	15,569	2,181
Marine Oils of All Kinds, Boiled, Oxidized, Sulphurated, Blown or Polymerized by Heat in Vacuum or in Inert Gas:	Denmark	137	246	34
	Finland	130	246	34
	Sweden	46	94	13
	Belgium & Luxembourg	7	11	2
	West Germany	111	198	28
	Netherlands	76	122	17
	Greece	16	24	3
	Algiers	114	199	28
	Indonesia	14	28	4
	Pakistan	27	54	8
	Others	1/	1	1/
	Total	678	1,223	171
	Total Marine Oils	133,210	192,219	26,926
Edible Marine Fats and Oils, Hydrogenated:	Total	44,651	85,111	11,924
Other Marine Fats and Oils, Hydrogenated:	Total	8,329	14,137	1,981
Spermaceti, Crude, Pressed or Refined:	Italy	11	42	6
	Czechoslovakia	6	27	4
	Poland	6	26	4
	Rumania	2	10	1
	Others	7	31	4
	Total	32	136	19
	Spermaceti, Other Total	32	42	6
	Other Marine Oils and Fats, Crude or Refined Total	11	14	2
	Grand Total	186,265	291,659	40,858

1/Less than 1,000 tons and US\$1,000.

Norway (Contd.):

Table 3 - Norwegian Exports of Herring Meal, 1959.			
Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000
Herring Meal:			
Sweden	4,601	5,794	811.8
Belgium & Luxembourg	6,125	7,639	1,070.2
France	12,637	15,280	2,140.7
Italy	2,362	2,890	404.9
Netherlands	6,995	8,857	1,240.9
United Kingdom	25,361	31,694	4,440.3
Switzerland	1,077	1,391	194.9
West Germany	5,138	6,444	902.8
East Germany	2,360	3,061	428.8
Austria	1,687	2,077	291.0
Others	2,758	3,364	471.3
Total	71,101	88,491	12,397.6

at US\$12.4 million or close to US\$174.36 a metric ton. None was shipped to the United States (table 3). (United States Foreign Agricultural Service Report, Copenhagen, April 12, 1960 and July 27, 1960.)

Note: Values converted at rate of 1 Norwegian krone equals US\$0.1401.

* * * * *

FISHERIES TRENDS, APRIL-JUNE 1960:

Total landings from the Norwegian cod fisheries during the second quarter of 1960, declined to 40,475 metric tons from about 63,638 tons for the same period of 1959. Total cod landings January 1-June 18, 1960, were only 111,059 tons as compared with 139,649 tons during the same period of 1959. The five-year average for 1955-1959 was 136,482 tons.

The Parliament on June 2, appropriated 20 million kroner (US\$2.8 million) to aid fishing vessel owners who have encountered financial difficulties as a result of the failure of the winter herring fisheries during the last three years. The money is to be used for low-interest loans to the owners for maintenance, repair, and purchase of fishing equipment.

North Norway fishermen have persisted in their demand that the Government should extend the fishing limit to 12 miles. Following the breakdown of the Law of the Sea Conference at Geneva, the Norwegian Foreign Minister stated in the Storting that Norway would in time move to extend its territorial waters for fisheries purposes. West Coast fishermen have objected to this announced delay by the Government. The Minister of Fisheries subsequently indicated in a press statement that it was not likely any exten-

sion would occur before 1961. Meanwhile, the Norwegian Government has undertaken bilateral discussions with the United Kingdom on fishing limits. (United States Embassy in Oslo, report of July 19, 1960.)

* * * * *

WHALING INDUSTRY TRENDS, JULY 1960:

The Norwegian whaling expeditions participating in the 1959/60 Antarctic pelagic whaling season ended operations on April 7, 1960, with production sharply below that of the preceding season. Total whale-oil production dropped from 118,800 long tons in the 1958/59 season to 98,000 tons in 1959/60, and sperm-oil production dropped from 14,000 tons to about 10,600 tons. The drop in production is reported to be due to stormy weather and to declining whale stocks.

No official statement as of mid-July had been made on Norway's participation in the 1960/61 whaling season in the Antarctic. However, newspaper articles have pointed to the possibility of a reduction in the number of Norwegian expeditions because of the generally unfavorable results of the past season. These articles appeared after it had been announced that the International Whaling Commission at its London meeting in June had recommended the suspension of the over-all whaling quota for the next two years, subject to the retention of national quotas.

Although Norway is no longer a member of the International Whaling Convention, the Government nevertheless sent an official observer to the London meeting. As of the end of June the Norwegian Government had given no public indication of its reaction to the Commission's recommendation. (U. S. Embassy in Oslo, July 19, 1960.)

* * * * *

NORWEGIAN COMPANY SELLS LAND-BASED WHALING STATION:

According to recent press reports, a Norwegian firm of Tønsberg, Norway, has sold its land-based whaling station, Husvik Harbour, in South Georgia, together with the supply ship *Teie* and two catcher boats. (United States Embassy, Oslo, August 19, 1960.)



Panama

FISH MEAL AND OIL INDUSTRY:

There are two fish-meal plants in Panama, one on Taboga Island and the other at Puerto de Caimito, about 15 miles west of Panama City. Each plant has a capacity of 8 to 10 short tons of raw fish per hour. Both have unloading pumps. The Taboga plant dries by hot air through a cyclone dryer, reputedly the only one in Latin America. The Caimito plant uses indirect heat from steam to dry the fish meal. The cooker and press of the Taboga plant are used equipment from the United States, and the dryer was constructed locally. The machinery of the Caimito plant was all used previously in the United States. Both plants now use settling tanks for separating the oil but expect to install centrifuges to improve the quality of the oil in the near future. The two plants have no plans at present to utilize the stickwater or for the production of fish solubles.

The Taboga plant started with the idea of using the fish caught by the shrimp trawlers, but soon abandoned this as impractical and turned to purse seines for catching anchoveta or "sardina agallona" (*Cetengraulis mysticetus*) and thread herring or "arenque" (*Opisthonema libertate*).

In 1959 about 8,500 short tons of fish were processed which yielded an estimated 2,000 tons of fish meal. The composition of the catch used for reduction was about 62.5 percent anchoveta and 37.5 percent thread herring. The processors much prefer the thread herring to the anchoveta as it is easier to work and yields a greater percentage of oil. If the anchoveta is not strictly fresh, it is difficult to press and the resultant meal contains a very high oil content. At times it is impossible to press at all unless mixed with thread herring or very fresh anchoveta. This same complaint against anchoveta was encountered in Venezuela. Neither in Venezuela nor in Panama do the plants use formalin and/or sodium nitrite. It is likely, however, that these preservatives will be used in Panama in the near future.

The fish oil produced by the two reduction plants is sold locally, reportedly for soap making. The producing plants do not analyze the oil. Oil yield varies considerably depending upon the species and condition of the fish. The thread herring, if it is claimed, produces more oil than the anchoveta. Recovery of as much as 6 percent, on a raw-fish weight basis, has been reported for thread herring. At times no oil is recovered from anchoveta.

Generally a higher protein percentage is yielded by thread herring meal than by anchoveta meal. Anchoveta meal usually runs between 60 and 65 percent protein and thread herring between 65 and 70 percent.

Table 1 - Analyses of Three Samples of Panamanian Fish Meal

Product	Anchoveta	Anchoveta	Thread Herring
	(Percent)		
Protein . . .	59.0	65.60	67.10
Fats . . .	12.0	4.06	2.75
Moisture . . .	6.7	8.10	6.07
Sand . . .	0.7	0.55	0.13
Salt . . .	0.6	0.23	0.30

The vessels used in the fish-meal industry are factory-owned. Only two vessels were operating in late June as the Taboga plant was shut down for repairs. The Caimito plant has only one purse-seiner, but is purchasing the catch from another vessel at a reported US\$10 a short ton. The same price is paid for thread herring as for anchoveta. Paper-lined burlap bags holding 100 pounds of fish meal are made locally and cost 30 cents each.

The price of local fish meal depends upon whether it is sold in small amounts or in quantity lots, and whether it is picked up at the plant or delivered to the buyer's warehouse. One firm quoted a price of 7 U.S. cents per pound for fish oil.

Table 2 - July 1960 Prices Quoted for Fish Meal by Panamanian Reduction Plant

Quantity	Delivered at Plant	Delivered to Customer's Warehouse
Up to 1 ton . . .	-	(US\$) . . .
2 to 5 tons . . .	-	140.00
Up to 5 tons . . .	130.00	-
More than 5 tons . . .	125.00	130.00

The Panamanian fish-meal producers are well protected by tariff. Import duty on fish meal is US\$0.20 per gross kilo plus one percent of the f.o.b. valuation at port of embarkation. On fish meal valued at \$100 a short ton at port of embarkation, the per-ton duty would amount to over US\$182.

No severance tax is charged for catching fish for reduction purposes. There are no export duties or restrictions on exports. Although one government source stated that there were no restrictions on imports of fish meal other than duties, the producers claimed that imports are not allowed if local fish meal is available.

In spite of heavy import duties, during 1959 Panama imported about 1,700 metric tons of fish meal and exported about 1,400 metric tons. The producers operated only during part of 1959 and for about five months no local fish meal was available; consequently, imports were permitted. It was reported that supplies of this imported meal were still on hand in late July 1960 and sales of local meal were moving slowly. According to official records, no fish meal was imported during 1958.

The Caimito plant recently installed a pump for unloading fish, but the problem still remains that only 2 or 3 hours at each high tide are available for unloading. The plant is under new management and plans are being considered for providing longer unloading periods and at least two additional vessels for its fleet.

The Toboga plant, during the height of the 1959 season had five seiners working. Three of these have been reconverted to shrimp trawling because of the amount of fish meal on hand and world marketing conditions.

Panama fish-meal producers claim that the local market absorbs less than 1,000 tons of meal a year. Local consumption probably will increase since it is understood that the government is sponsoring programs for increasing poultry and livestock raising.

There appears to be sufficient raw material available for the two Panama plants to supply the country's present and future fish meal needs for some time to come. With the current world price of meal, Panama producers claim they cannot now export at a profit. When marketing conditions improve, Panama should be in a position to export several thousand tons of fish meal a year. It does not seem likely that Panama will ever be able to export large quantities of fish meal since the supplies of raw material appear to be limited, according to a July 29, 1960, dispatch from the United States Embassy in Mexico City.



Portugal

FISHERY TRENDS, JULY 1960:

As of mid-July 1960, the Portuguese fishing season was not sufficiently advanced for accurate assessment of the prospects for 1960. However, the catch on the Greenland Banks, where the cod-fishing fleet was fishing in July, was much more favorable this year. This is welcome news after the poor catches of 1958 and 1959. According to reliable sources, the cod-fishing fleet caught fish at a rate of 50 percent higher than that of the 1959 season, in which the catch was 53,344 metric tons of wet-salted cod. Dried cod was in adequate supply for consumers during the second quarter of 1960 and the press has not reported further incidents of hoarding and sales at prices above those fixed by the government.

Reports from the sardine fishing areas indicated that the catch promises to be a large one again this year, but this will remain uncertain until after the important months of August and September. Preliminary figures on the sardine catch for January-May provided by the Fisheries Commission show a total of 15,314 tons as compared with 11,588 tons for the same period of 1959.

Prices paid for sardines have been higher this year. During the first quarter, the value per ton of the respective catches was about 3,652 escudos (US\$127.68) a ton for 1960 as against 2,619 escudos (US\$91.57) a ton during the first quarter of 1959. One factor in the higher prices paid this year is the substantial reduction of stocks of canned sardines which had affected the market, particularly in the northern part of the country, ever since the high production years of 1957 and 1958. The reduction of those stocks is a healthy development which should make for a more orderly market.

Canned fish production in the first quarter of 1960 exceeded that of 1959. According to official statistics, 2,295 tons of sardines and 504 tons of tuna were produced as compared with 1,907 tons and 128 tons, respectively, in 1959. Canned anchovy production, however, is less so far this year. Production is thought to be affected by the large volume of 1959 production and exports (6,210.4 tons), and the relatively low prices obtained recently for anchovies. Exports of canned fish declined during the first quarter of 1960, and canned sardine exports were 11 percent less than in the first quarter of 1959.

The Portuguese Government by Decree No. 43056 of July 8, 1960, authorized the Fund for the Renovation and Reequipment of the Fishing Industry to issue its third series of bonds to finance projects under the Second Six-Year Development Plan. The new financing is in the amount of 24 million escudos (US\$840,000) and is not earmarked for specific projects, but will assist in the financing of any projects which may have been included in the development plan. (United States Embassy report from Lisbon, July 22, 1960.)

* * * * *

FISHING INDUSTRY RENOVATION AND REEQUIPMENT BOND ISSUE AUTHORIZED:

The Portuguese Ministries of Finance and Navy have published a joint decree (No. 43056 published in the *Diario do Governo* of July 8, 1960), authorizing the issuance of bonds to a total of 24 million escudos (US\$840,000) bearing an interest rate of 4 percent for the use of the special Government Fund for the Renovation and Reequipment of the Fishing Industry. The Fund au-

thority is also authorized to make appropriate arrangements with the Caixa Geral de Depositos, Credito e Previdencia or any other national credit institution for the sale of these bonds either to said institutions or to the public. (United States Embassy, Lisbon, July 21, 1960.)

* * * * *

FISH MEAL AND OIL INDUSTRY:

Production of fish meal in Portugal is small. In 1958, the most recent year for which statistics are available, 230 metric tons of fish meal and 150 tons of fish oil were produced. Both meal and oil are produced almost exclusively from waste of sardine canneries.

The fish meal and oil industry in continental Portugal is an adjunct to the sardine canning industry rather than an industry in its own right. There is no fishing of any importance directly for the reduction plants.

There are no special government aids to the industry and no special taxes or restrictions on foreign trade. As might be expected from the type of production, there are practically no exports. On the contrary, some imported Angolan fish meal is consumed in continental Portugal. There is also a substantial transit trade in fish meal from the Portuguese African provinces through metropolitan Portugal to European countries, chiefly Germany.

It may be of interest to mention the prices currently quoted in Lisbon for Angolan fish meal and oil. Angolan fish meal with a protein content of 60 percent or more, and without a guarantee as to the absence of *salmonella*, is quoted at about \$70 per metric ton f.o.b. Angola. Fish oil is currently quoted at 10.5 to 11.2 U.S. cents (3.00 to 3.20 escudos) per kilo f.o.b. Angola.

Two of Portugal's cod trawlers have pilot installations on board for the production of fish meal. Annual production of these vessels is estimated by a trade source at about 10 metric tons. (United States Embassy, Lisbon, August 5, 1960.)



Sierra Leone

FISHING INDUSTRY DEVELOPING RAPIDLY:

Tuna: In recent months large schools of tuna have been found in the Atlantic Ocean well outside the territorial waters of Sierra Leone (in West Africa next to Liberia), but within easy reach of Freetown, the capital, states an information release by the Sierra Leone Department of Information.

United States and Japanese tuna fishing vessels have undertaken exploratory surveys in the coastal waters with the result that a large United States tuna canning firm has started buying tuna from Japanese and Spanish clippers in Freetown. The landing and storage are carried out by an Italian firm at Kissy, near Freetown, for ultimate shipment to the United States.

Between January 20 and May 24 this year, 30 tuna vessels arrived in Freetown. At present 29 Africans are permanently employed by the Italian firm for handling tuna.

According to the news release, this could be the beginning of a new industry. If a cannery can be set up in Freetown (which has the best natural harbor in West Africa) and worked with local labor, Sierra Leone canned tuna might one day bring a valuable income from the markets of the world.

The officer-in-charge of the Sierra Leone Government Fisheries Development and Research Unit states that, "the future of the fishing industry in Sierra Leone is tuna; it's a big earning crop and it is highly valuable."

Other Fishery Developments: From an undeveloped industry which mainly consisted of indigenous fishermen going out to fish in small canoes, Sierra Leone's industry has developed into an organized industry. This progress is reflected in the increase in the tonnage and value of fish landings; the techniques, the encouragement by Government of foreign firms, and the benefits accrued from research carried out by the Government Fisheries Development and Research Unit at Kissy, which replaced the West African Fisheries Research Institute in October 1957.

In 1959, landings by ten trawlers were about 273,301 cases of demersal fish, weighing about 2,375 metric tons and having a

landed value of £146,796 (US\$411,000). The species landed included skate, shark, ladyfish, whiting, gwangwa, sheepshead, crocus, snapper, catfish, and sole.

Total fishery landings in Sierra Leone for 1959 are estimated at 23,750 metric tons, compared with an estimate of 5,000 tons in 1945.

In Sierra Leone there has been an enormous increase in the number of fishermen--there are now about 3,000 bonga canoes, where there were only 300 in 1945. Yeligungu nets are now used for bonga fishing as well as the original cast nets, and the latest novelty is the Ghanaian "ali-net."

At Lumley Beach and at Murray Town (about 4 miles from Freetown) trawlers land their catch. In 1945 there were no trawlers in Sierra Leone; now there are 10, some owned by European companies, others by Africans.

The Government encourages foreign investors, especially those who welcome Sierra Leonean participation and provide training facilities for Sierra Leoneans. This policy has yielded good results.

One of the fishing companies participating in Sierra Leone's fishing industry was originally formed in Liberia seven years ago. The company started operating in Sierra Leone in December 1959 when it bought up an Italian firm. Its headquarters are at Murray Town. It owns 3 large trawlers which go out fishing every other day and 2 small ones which fish daily. They go as far as 60 miles down the coast. This company has a staff of 14 Italians and 100 Sierra Leoneans who are employed as fishermen, net menders, carpenters, machinists, mechanics, salesmen, and clerks. It has two stores in Murray Town.

There are other fishing enterprises in Sierra Leone run jointly by foreign and local capital. One example of this is one in Saw-pit, Freetown.

Sierra Leone is the only country on the West Coast of Africa which has passed legislation to conserve its fisheries. The Fisheries Development and Research Unit has implemented protective measures to prevent overfishing. Big trawlers are not allowed to fish within one mile of the coast and in any of the estuaries. The Unit has introduced

Sierra Leone (Contd.):

set nets to charter boats and it conducts fish preservation experiments. In addition, it carries out biological work to assist in the implementation of mesh-size regulations.

Fishing boats 28 feet long built in Ghana are made available to local fishermen by the Unit. Applications are received from local fishermen, and successful applicants are given a loan which they repay under a revolving loan scheme. Local fishermen are also trained by the Unit. The fishing boats are for the development of inshore fisheries. The Unit helps indigenous fishermen with set nets. Those with money buy the charter boats which cost £1,700 (\$4,800) each.

Sierra Leone's fishing industry falls into two categories: (1) inshore fishing which consists of the charter boats and the large Italian-type trawlers; and (2) the offshore pelagic fishery for tuna.

A recent successful introduction has been the set net which is now in great demand by Sierra Leone canoe fishermen and promises to be a useful means of increasing their catch rate. (United States Consulate, Freetown, July 27, 1960.)



Turkey

TERRITORIAL WATERS LIMIT SET FOR NAVIGATION AND FISHING:

According to a report published in the Greek fisheries periodical *Alieia* (July 1960), the Turkish Committee of the National Salva-



tion of the General Gioursel Government has voted a new law for Turkish territorial waters. The law fixes Turkish territorial waters at six nautical miles for navigation and 12 nautical miles for fishing.

Union of South Africa

IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1959:

In 1959, the Union of South Africa imported almost 11.9 million pounds of fish and shellfish products valued at US\$4.1 million. The same year the Union of South Africa exported 132.9 million pounds of edible fish and shellfish products, valued at \$28.7 million; 5.8 million Imperial gallons of fish-body and liver oils, valued at \$3.9 million; and 219.2 million pounds of fish meal, valued at \$13.0 million.

Table 1 - Union of South Africa Imports of Fish and Shellfish Products, 1959

Item	Quantity 1,000 Lbs.	Value L	Value US\$
<u>Fish Fry and Ova:</u>			
Total	N. A.	207	579
From United States	N. A.	90	252
<u>Caviar, Lox, Lobster & Anchovies:</u>			
Total	389.3	112,226	313,672
From United States	1.0	910	2,543
<u>Fish Paste:</u>			
Total	279.8	66,285	185,266
From United States	-	66	184
<u>Sardines in Oil, Canned (Includes Sild, Brisling, and Sildines):</u>			
Total	3,746.9	482,522	1,348,648
From United States	-	-	-
<u>Other Preserved, Canned Etc.:</u>			
Total	1,303.3	164,980	461,119
From United States	27.8	11,902	33,266
<u>Salmon, Canned:</u>			
Total	1,206.1	208,607	583,057
From United States	3.8	1,137	3,178
<u>Fish, Fresh, South African-Caught:</u>			
Total	532.1	131,909	368,686
<u>Fish, Fresh, not South African-Caught:</u>			
Total	450.4	39,665	110,864
From United States	-	-	-
<u>Fish, Dried, Salted and Cured:</u>			
Total	3,384.9	191,682	535,751
From United States	3.1	530	1,482
<u>Fish, Preserved, not Canned:</u>			
Total	582.9	77,524	216,680
From United States	5.9	1,757	4,911
<u>Grand Total</u>	<u>11,875.7</u>	<u>1,475,607</u>	<u>4,124,322</u>
<u>Grand Total from United States</u>	<u>41.6</u>	<u>16,392</u>	<u>45,816</u>
<u>N. A. - Not Available.</u>			

Union of South Africa (Contd.):

Table 2 - Union of South Africa Exports of Edible Fish and Shellfish Products, by Country of Destination, 1959

Product and Destination	Quantity	Value	
		1,000 Lbs.	£
Fish, fresh and frozen:			US\$
United States	361.3	19,554	54,654
United Kingdom	1,351.2	82,421	230,367
Australia	10,175.3	608,676	1,701,249
Nigeria	238.9	6,866	19,190
Rhodesia and Nyasaland	6,207.6	289,131	808,121
Mozambique	868.5	26,629	74,428
Angola	619.5	16,651	46,540
Ships' Stores	608.0	49,395	138,060
Mauritius	536.0	24,510	68,505
Others	414.7	18,853	52,694
Total	21,381.0	1,142,686	3,193,808
Filchards, canned:			
United States	458.5	21,157	59,134
United Kingdom	23,679.6	1,258,656	3,517,944
Ceylon	1,621.2	62,262	174,022
Malaya	8,465.7	413,984	1,157,086
Ghana	12,125.7	686,466	1,918,672
Nigeria	1,246.2	64,513	180,314
Pacific Islands	1,202.0	54,017	150,978
Congo	1,392.7	63,768	178,232
Philippine Islands	24,200.0	1,266,208	3,539,051
Burma	4,152.0	179,003	500,313
Canada	1.5	56	156
Others	7,126.3	376,223	1,051,544
Total	85,671.4	4,446,313	12,427,446
Fish, dried, salted and cured:			
United States	N.A.	3	8
Australia	5,944.0	325,743	910,452
Ghana	1,074.1	44,873	125,420
Mauritius	1,423.5	59,663	166,758
Rhodesia and Nyasaland	501.9	25,308	70,736
Belgian Congo	4,382.9	188,364	526,477
Reunion	134.5	5,991	16,745
Fr. Equatorial Africa	225.0	9,700	27,112
Others	181.8	15,312	42,797
Total	13,867.7	674,957	1,886,505
Spiny Lobster Tails, frozen:			
United States	9,387.5	2,729,979	7,630,291
United Kingdom	80.0	22,000	61,490
Rhodesia and Nyasaland	65.9	20,343	56,859
France	38.1	9,766	27,296
Others	67.5	21,891	61,185
Total	9,639.0	2,803,979	7,837,121
Spiny Lobster, canned:			
United States	185.1	72,912	203,789
United Kingdom	7.5	2,925	8,175
Canada	8.3	3,250	9,084
Belgium	29.8	11,701	32,704
Congo	9.3	3,707	10,361
France	124.4	49,043	137,075
Western Germany	105.7	41,538	116,099
Others	13.7	5,064	14,154
Total	483.8	190,140	531,441
Fish Fry and Ova:			
Total	N.A.	404	1,129
Fish Pastes:			
Total	16.5	3,227	9,019
Fish, other--canned, other than canned, etc.:			
United States	2,719.2	123,402	344,909
United Kingdom	591.0	28,307	79,118
Ceylon	148.6	7,506	20,979
New Zealand	566.1	51,451	143,806
Malaya (Singapore)	402.5	46,542	130,085
Ghana	5,300.1	288,315	805,840
Nigeria	115.4	5,390	15,065
Mauritius	431.9	23,741	66,356

(Continued)

Table 2 - Union of South Africa Exports of Edible Fish and Shellfish Products, by Country of Destination, 1959 (Contd.)

Product and Destination	Quantity	Value	
		1,000 Lbs.	£
Br. West Indies	428.2	23,853	66,669
Rhodesia and Nyasaland	876.4	53,365	149,155
Pacific Island	1,293.6	66,701	186,429
Congo	530.4	21,203	59,262
Philippines	3,468.7	167,973	469,485
Venezuela	132.0	6,325	17,678
Liberia	867.6	34,340	95,980
Burma	720.0	30,000	83,850
Others	289.1	18,872	52,748
Total	1,808.8	997,286	2,787,414
Grand Total, Edible . . .	132,940.2	10,258,992	28,673,883

South African imports of fishery products from the United States amounted to US\$45,800 or 1.1 percent of the total value of fishery products imported. Exports of edible fish and shellfish products to the United States totaled US\$8.3 million. Frozen spiny lobster tails was the principal fishery product exported to the United States; in fact, the United States bought 97.4 percent of those exports.

Table 3 - Union of South Africa Exports of Fishery Byproducts, by Country of Destination, 1959

Product and Destination	Quantity	Value	
		1,000 Lbs.	£
Fishery Byproducts:			US\$
Fish Meal:			
United States	23,510.4	475,383	1,328,695
United Kingdom	79,580.4	1,712,297	4,785,870
Canada	660.0	13,200	36,894
Malaya	9,391.0	234,390	655,120
Kenya	829.4	22,140	61,881
Rhodesia and Nyasaland	11,052.8	243,456	680,460
Congo	514.0	10,941	30,580
France	6,346.6	135,070	377,521
Western Germany	32,664.7	633,620	1,770,968
The Netherlands	8,403.2	161,435	451,211
Italy	1,521.0	38,477	107,543
Yugoslavia	12,462.8	276,476	772,750
Philippines	534.5	11,054	30,896
Israel	29,491.8	626,415	1,750,830
Others	2,204.9	48,325	135,069
Total fish meal	219,167.5	4,642,679	12,976,288
		Imp. Gals.	£
			US\$
Fish-Liver Oil:			
United States	29,276	12,668	35,407
United Kingdom	3,047	4,613	12,893
Norway	149,303	67,727	189,279
Others	3,102	2,632	7,357
Total	184,728	27,640	244,954
Fish-Liver Oil, concentrated--Total . . .	4,619	18,012	50,344
Fish-Body Oil:			
United States	10,215	4,240	11,851
United Kingdom	5,125,757	1,148,653	3,210,485
Australia	31,693	11,002	30,750
The Netherlands	424,964	105,339	294,423
Italy	27,765	9,882	27,620
Others	8,223	3,278	9,162
Total fish-body oil . . .	5,628,617	1,282,394	3,584,291
Grand Total fish oils . . .	5,817,964	1,388,046	3,879,589

The most important customer for all South African fishery products and byproducts in 1959 was the United Kingdom, which dollar-wise imported US\$11.9 million, followed by

Union of South Africa (Contd.):

the United States which imported US\$9.7 million. (U. S. Consulate dispatch, Cape Town, June 29, 1960.)

Note: Values converted at rate of £1 equals US\$2.795.

* * * * *

LANDINGS OF PILCHARD-MAASBANKER AS OF JUNE 30 EXCEEDED 1959 SEASON TOTAL:

The Union of South Africa's commercial fishing industry has had exceptionally good landings of pilchards, maasbunker, and mackerel during the current fishing season. Up to the end of June 1960, about 150 vessels landed 300,000 short tons of pilchards and maasbunker, and 27,000 tons of mackerel. The landings through June exceeded the entire landings for the 1959 season which ended on July 31.

The landings by the Union of South African vessels as of the end of June do not include the South-West African landings, usually equal to the Union's. The next pilchard season will begin in Union waters on January 1, 1961, and the maasbunker and mackerel season on November 1, 1960. (United States Embassy, Pretoria, August 11, 1960.)



Union of South Africa and South-West Africa

FISH MEAL AND OIL INDUSTRY TRENDS, JANUARY-MAY 1960:

The production capacity of fish meal and oil reduction plants in the Union of South Africa and South-West Africa is limited by annual quotas on the pilchard-maasbunker catch. The limit in effect this year in South-West Africa is 310,000 short tons for the combined catch of pilchards and maasbunker. The annual quota limit for pilchards and maasbunker in the Union of South Africa still remains at 250,000 tons. In the event that the landings have not reached the quota limit by September 1, it has been the policy of the South African Division of Fisheries to permit the season to remain open until such time as the limit is reached, or to December 31, the close of the quota year. In theory, fishing vessels may continue catching pilchards and maasbunker until September 1 even though the quota has been exceeded before that date. Actually the 1959 season was declared closed on August 14, due to the high proportion of immature fish being landed and it was voluntarily agreed between industry and the Division of Fisheries that the 1960 season close on July 31 because of heavy landings.

Fishing vessels until June 1960 were paid a uniform price of £4.12.6d. per short ton (about US\$12.95) in the Union of South Africa for pilchards, maasbunker, and

mackerel. Because of the sharp drop in fish-meal prices, fishermen accepted a voluntary 12½-percent reduction for the months of June and July.

Available information indicates that reduction plants in South-West Africa (Walvis Bay) are paying the vessels £4.10.0. (\$12.60) a short ton for pilchards and maasbunker this year.

Fish-meal production by the Union of South Africa for the first five months of 1960 amounted to 61,287 short tons as compared with 39,167 tons produced in January-May 1959. Production of fish meal by South-West Africa January-May 1960 totaled 20,381 short tons, an increase of 27.8 percent from the 15,949 tons produced in the same 5-months period of 1959. The production of fish meal during January-May 1960 by both South Africa and South-West Africa totaled 81,668 tons or an increase of 48.2 percent from the 55,116 tons produced in the same period of 1959. Export prices for fish meal c.i.f. United Kingdom as of mid-1960 were about £35.00 per long ton or US\$87.50 a short ton.

Estimated production of fish oil from January-May 1960 in the Union is 20,000 long tons and 5,000 long tons in South-West Africa. This compares with 11,159 long tons in the Union and 4,201 long tons in South-West Africa for the same period of 1959. Export prices for fish oil c.i.f. United Kingdom in mid-1960 were about £55.00 a long ton or about US\$137.50 a short ton.

Fish-solubles production statistics are not available. A considerable portion of this production is mixed with fish meal. Actual exports of solubles are estimated to be between 2,500 and 3,000 tons per year. The last sale of this item from the Union was made in May 1960 at a price of £45.00d. per long ton (about US\$126.00 a long ton or \$110.50 a short ton) c.i.f. Europe.

Aside from the exceptionally large landings of pilchard-maasbunker made in South African and South-West African waters, another feature of the present season is the good oil yield. It is estimated that the total fish-oil production for the Union and South-West Africa will amount to approximately 75,000 long tons in 1960.



U.S.S.R.

FISHERY CONFERENCE IN RIGA:

During January 7-9, this year, there was a conference in Riga of fishery people from the northwestern part of the Soviet Union and of scientists from all over Russia. The trade paper *Rybnoe Hozjaistvo*, issue no. 4, 1960, reported that there was good fishing in the Atlantic Ocean in 1959. The catch was 13 percent greater than in 1958 despite smaller herring catches. The average yield, both for herring trawlers and bottom trawlers increased in 1959—"Murmansk" in Murmansk especially showed good results.

In 1959, 36 medium trawlers each caught over 10,000 hectoliters (930 metric tons) of herring. A trawler from Karelen had the largest catch—12,750 hectoliters (1,186 tons).

The fishing area was enlarged, especially for the medium trawlers, which, in addition

U. S. S. R. (Contd.):

to gill-net fishing for herring in the Norwegian Sea also did well fishing with bottom trawls for groundfish and herring in the Western Atlantic, North Sea, and Barents Sea.



Good catches were obtained in the sardine fishery in the central Atlantic. Vessels from Kalingrad and Kherson took part in that fishery.

There were deficiencies and weaknesses in many areas--especially in the utilization and disposition of vessels and raw material. Also organization and experience were lacking in important areas.

The planned U. S. S. R. goals for 1959 were not met. During the first 9 months barely two-thirds of the active portion of the fleet fulfilled the planned quota. The catch of the remaining vessels was, in part, well under the average for the fleet as a whole.

Personnel, especially in the fleet from Kalingrad and Latvia, were unstable and there was considerable replacement. For example, 80 percent of the captains in Kalingrad's fleet were replaced in 1958/59, and for Latvia there was even greater turnover.

The fishing fleet lost considerable time waiting for the floating factoryships and the motherships as well as when going to and from the fishing grounds. Some of the vessel groups used up to 16 percent of their time in unproductive cruising.

The use of mechanical equipment and fishing gear was not efficient. Expenses were heavy, which led to a significant increase in the cost of fish, especially herring.

The effort to find and utilize new fishing grounds was not given adequate attention. Therefore, too great a concentration of fishing vessels occurred in the Norwegian Sea which led to poorer yields and reduced effectiveness.

The lack of research vessels in the fishery research service hindered, to a great degree, the Kalingrad area in increasing its fishing operations in the central and western parts of the Atlantic.

For 1960, there is foreseen a significant intensification of effort to discover new fishing areas in the northwesterly and central parts of the Atlantic. The scientific institutions--Vairo, Baltniro and Pinro--were given the task of developing a concrete plan, by March 10, 1960, for expanding the herring fishery in the northwestern Atlantic areas together with working out a cooperative method for research. To carry out the work the Murmansk and Kalingrad areas are being allotted four vessels of the "Ocean" type.

To meet the increasing demand for research and to discover new fishing grounds, it is considered necessary to build a series of exploratory vessels and fishery research vessels of the "Orlik" trawler-type which was built in East Germany.

It is also considered necessary to expand international cooperation in the fields of fishery research and regulations for the fisheries--especially an intimate cooperation with Poland and East Germany which are said to have greater experience than the Russians about fishing in the North Atlantic and the North Sea.

A further curtailment of the spring herring fishery is considered worthwhile. In its place a maximum number of medium trawlers will fish in the spring and summer seasons for groundfish and herring in the northwestern part of the Atlantic, North Sea, and Barents Sea. A concrete plan has been developed for organizing the 1960 fishing of the medium trawlers for the ocean perch and herring fisheries in those areas. (*Fiskets Gang*, July 14, 1960)

* * * * *

FISHING FLEET ON NEWFOUNDLAND BANKS:

The biggest fishing fleet ever sent by the Soviet Union to the Newfoundland banks is re-

U. S. S. R. (Contd.):

ported to have arrived this season, putting in the shade the "traditional" fleets of Portuguese, Spanish, and French vessels fishing there.

A total of 160 Russian vessels with total crews of 25,000 are reported to be fishing in the area.

The result is a renewed appeal from the Newfoundlanders themselves that fleet strength should be limited by the International Commission for Northwest Atlantic Fisheries.

As the Russian vessels bring their own supplies, even the advantage of stocking up in Newfoundland has been denied to the islanders. (The Fishing News, July 29, 1960.)



United Kingdom

NEW INTEREST RATES ON FISHERIES LOANS EFFECTIVE JUNE 20:

The British White Fish Authority announced that, as a result of a recent increase in the rates of interest charged to them by H. M. Treasury, some of their own rates were changed as from June 20, 1960.

The new rates are:--

On loans for not more than 5 years, $5\frac{1}{2}$ percent: no change.

On loans for more than 5 years but not more than 10 years, 6 percent: increase $\frac{1}{4}$ percent.

On loans for more than 10 years but not more than 15 years, $6\frac{3}{8}$ percent: increase $\frac{1}{2}$ percent.

On loans for more than 15 years, $6\frac{1}{4}$ percent: no change.

* * * * *

THREE FREEZER-TYPE TRAWLERS TO BE ADDED TO FLEET:

British distant-water trawler owners, faced by the dual menace of dwindling catches and narrowing fishing limits, are building what promises to be the world's finest fishing fleet of trawlers for freezing fish at sea.

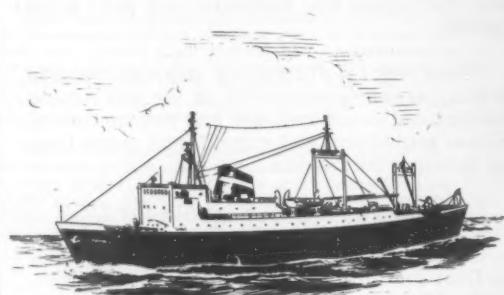
The latest, largest, and most up to date of the vessels has been ordered by a Hull company. She will be the first British side-trawler to freeze the whole of her catch at sea. This means that she will sail farther and can stay out longer, yet her catch will be landed in good condition.

The first all-freeze vessel will be 230 feet in length (214 feet between perpendiculars)--nearly 30 feet longer than the largest British trawlers at present in commission. She will be Diesel-electric powered, and have a hold capacity of 560,000 pounds per trip.

An Aberdeen firm has been given the contract to build the revolutionary new vessel. The vessel will have a freezing capacity of about 49,000 pounds a day. The trawler will be capable of making trips of about four weeks' duration, but it is not certain yet how many men will be carried. The vessel is expected to have a speed of about $14\frac{1}{2}$ knots, and delivery is expected towards the end of 1961.

Two other British companies are already engaged in building freezerships. In September 1959 a Hull firm announced its plan to build a super-trawler of 220 feet in length, which will be named the Lord Nelson. She will be launched from a German shipyard this autumn.

The Lord Nelson will freeze only part of her catch. She will be Britain's first distant-water stern-fishing vessel, as distinguished from the Fairtry factoryship-type vessel.



The Fairtry II, a British factoryship trawler.

A third Hull firm has now entered the field, and has also placed an order for a freezer-trawler. This vessel may freeze all or part of her catch, but details of her size and equipment still remain to be decided. Like the first freezer-trawler, she will be built in Britain.

The three Fairtry vessels also freeze their catch at sea, but they are factoryships of more than 2,000 tons. Double the size of an average trawler, they process and fillet their catch on board. They carry a crew of 50 or more, and stay at sea for three months at a time against the conventional trawlers' average of three weeks per trip. (Fish Trades Gazette, July 9, 1960.)



Venezuela

FISH MEAL INDUSTRY:

Venezuela has five fish-meal plants in operation and two under construction. The operating plants are all located on the Gulf of Cariaco and were installed to handle the waste from the sardine (Clupanodon pseudohispanicus) canning

Venezuela (Contd.):

operations. Four of these plants are located in or near Cumana and one is on the Isla Mariquitar. The total capacity of the 5 plants is about 22 tons of raw fish or fish waste per hour. One of the new plants will be located on the Isla Mariquitar and will have a capacity of 5 tons of raw fish per hour. The second new plant will be a floating reduction plant with a capacity of 7½ tons of raw fish per hour.

Four of the active fish-meal plants have used equipment from the United States. The plant with the smallest capacity was purchased new from Denmark. Three of the plants use steam as a source of heat for drying the fish meal and two use a direct flame process.

The operating plants produce fish meal only and no oil or stickwater is saved. Of the plants under construction, one--being mounted on a barge--is planned for producing both oil and solubles. The solubles will be put back into the fish meal. The other will produce fish meal and oil but no solubles. Both will use indirect heat for drying the fish meal.

Total consumption of fish meal in Venezuela in 1959 is estimated to have been about 7,000 metric tons. Of this amount, 2,300 tons were produced locally and the remainder imported. The production of fish meal in 1959 was up about 10 percent from the 2,100 tons produced in 1958. No fish oil was produced locally.

Imports of fish body oil during the first 11 months of 1959 amounted to 3.5 tons, valued at US\$2,460. Of this total the United States supplied 1.1 tons, valued at \$1,832 and Norway 2.4 tons valued at \$630.

The bulk of the fish meal is from sardine waste from the fish canneries, but some fish meal is produced from tuna waste. In August 1959, the Government permitted the use of whole "rabo amarillo" (*Centengraulis edentulus*) for making meal. About 1,500 tons of "rabo amarillo" were taken during 1959, but owing to processing difficulties, only about 180 tons of fish meal were produced.

Of the three types of fish meal, that produced from tuna waste yields the highest protein content and that from sardine waste the lowest. Tuna-waste meal generally has 65-70 percent protein. "Rabo amarillo" runs 60-65 percent, and sardine waste from 50-60 percent.

Most of the fishermen in the sardine fishery are on a straight salary basis during the fishing season, the height of

Table 1 - Venezuela's Fish Meal Production, 1955-59

Year	Metric Tons
1959	2,303.1
1958/	2,100.0
1957	1,479.6
1956	973.2
1955	859.2

/Approximation.

which is between November or December through July or August. The fishermen are provided with nets (now nylon) and are paid a daily wage of about US\$2.25 a day plus 15 U.S. cents for each trip of fish. The fishermen usually average one or two trips a day and consequently their wage runs between \$2.40 and \$2.55 a day. The factory supplies the fishing gear and picks up the fish. The fishermen provide the labor and their own food.

The nets are beach seines from about 136.7 yards to 328.1 yards long and 19.7 to 26.2 yards deep. The mesh of the body is $\frac{1}{2}$ -inch square and that of the wings 1-inch square. From 10 to 20 or more men are employed for each beach seine.

All fishing is during the day. A lookout is maintained on a hilltop and as a school of sardines approaches shore the fishermen, using non-motored skiffs, are directed from the

hilltop on the setting of the seine. The catch, which may run as much as 400 tons but usually between 15 and 30 tons, is towed to the beach and maintained there alive either in the seine in which it was caught or in a smaller net. If additional fish are caught before the first catch has gone to the cannery the later arrivals are incorporated with the earlier by bringing the net and catch around the first impounded fish and removing the inner net. By this means, if fishing is good, some fish may be in the impoundment for two or three months. The fish are transported to the cannery at night either in motor launches or in barges towed by motor launches.

The "rabo amarillo" is captured in the same fashion as the sardine. It is not taken in the Gulf of Cariaco but along the north shore of the Peninsula de Araya and around the Islands of Coche and Margarita. For "rabo amarillo" the fishermen are paid 25 to 30 bolivars (US\$7.51-9.01) a metric ton. The nets are furnished by the plant.

If a cannery does not have reduction equipment or if its equipment is not operating, the usual practice is to send the cannery waste to another plant where the processing is done for 50 percent of the meal produced.

The Venezuelan Government does not permit the use of whole sardines for making fish meal. Until 1959 (with the exception of a few months in 1957) the use of any whole fish for making fish meal was prohibited. In 1959, after the sardine season was about over, the Government, in attempting to encourage greater fish-meal production, allowed the use of whole "rabo amarillo," "machuelo" (*Opiisthonema ocellatum*) and bagre (marine catfishes) for meal production.

Table 2 - Venezuelan Fish Meal Analyses

Product	Tuna Waste	"Rabo Amarillo" (Whole)	Sardine Waste	Sardine Waste
(Percent)				
Water	5.9	7.8	6.9	7.1
Protein	68.0	62.3	53.8	56.8
Fat	7.6	9.0	6.4	15.5
Fiber	0.5	0.7	0.6	0.7
Nitrogen-free extract	4.8	0.0	5.6	0.4
Ash	13.1	20.2	26.7	19.5

Import duty on fish meal is high. It is 0.15 bolivars per gross kilogram, which amounts to over US\$41 per gross short ton. Import duty on fish oil (not including cod-liver oil) is also high at 1.20 bolivars per gross kilogram which is over US\$0.16 per gross pound.

Meal in large amounts sells for 500 bolivars a metric ton and in small amounts for 560 bolivars. These prices are f.o.b. plant and amount to about US\$132 and \$152, respectively, a short ton. It is understood that locally-produced meal must first be used before meal can be imported.

Although no fish meal is exported from Venezuela, there are no export duties or restrictions on the export of fish meal or fish oil. No severance taxes are charged for catching fish for meal or for canning.

One of the two plants under construction will be mounted on a barge and based at Isla Coche. The equipment for this plant is used machinery of conventional design purchased in the United States. Plans call for producing oil and concentrating the stickwater and putting it back into the fish meal. The fish meal will be dried by indirect heat produced by steam. The principal source of raw material will be "rabo amarillo."

The processing machinery for the Punta de Piedras plant is locally designed and is being constructed locally. The design is somewhat revolutionary in concept in that it is understood that the fish, chiefly "rabo amarillo," will be cut by hand, cooked, drained, pressed under cloth and dried on a

Venezuela (Contd.):

Table 3 - Venezuelan Fish Meal Imports, 1955-58 and First 11 Months of 1959

Country of Origin	11 mos. 1959		1958		1957		1956		1955	
	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000
United States	3,136	517	1,583	271	443	70	99	15	110	10
Canada	-	-	-	-	828	155	404	78	1,805	359
Denmark	-	-	-	-	-	-	900	84	400	69
Sweden	-	-	-	-	-	-	500	66	-	-
Chile	-	-	452	64	97	15	-	-	-	-
Peru	602	103	401	49	380	45	-	-	-	-
Portugal	-	-	138	20	-	-	-	-	-	-
Mexico	466	75	-	-	-	-	-	-	-	-
Other 1/	-	-	-	-	25	4	5	1	20	5
Total	4,204	695	2,574	404	1,773	289	1,908	244	2,935	443

1/Includes 20 tons from Norway in 1955 and 5 tons in both 1956 and 1957, plus 21 tons from Panama in 1957.

conveyor mechanism under indirect heat. Half way through the conveyor the drying product will be given one turn. On completion of drying, which will take about one hour, the product will be double milled and sacked.

According to the designer the drying mechanism will serve a dual purpose. In addition to drying meal it will be used to precook sardines prior to canning. The immediate use, however, will be for drying fish for meal from "rabo amarillo" and machuelo. The canning machinery will be installed at a later date.

The local Venezuelan market now consumes about 7,000 metric tons of fish meal a year. At present fish meal is sold at a fixed price per ton irrespective of protein content. The same price is paid for 50 percent protein fish meal as for 70 percent. It is expected, however, that this procedure will change in the near future and prices will be based on actual protein value. Current annual production of meal is 4,000 to 5,000 tons below annual consumption. Government policy is protectionist and is encouraging meal production.

The Government is sponsoring programs for increased egg, hog, and cattle production which should, as these programs develop, stimulate increased fish-meal consumption.

Waste from sardine and tuna canneries has been able to produce less than half the fish-meal requirements of the country. There is little likelihood that there will be any great increase in fish-meal production from these sources in the immediate future, and it is unlikely that the use of whole sardines for making fish meal will be permitted.

However, there appear to be relatively large resources of "rabo amarillo" and "machuelo" which probably can supply the local fish-meal demand for the immediate future. The plants, in their initial experiments with "rabo amarillo," encountered technical difficulties in processing this fish when it was not extremely fresh. It is believed, with proper technical direction, that these difficulties can be overcome. Consequently it is anticipated that within the next few years Venezuela probably will be self sufficient with respect to fish meal.

It is unlikely, owing to fishing methods and production costs, that Venezuela will be in a position to export fish meal in the foreseeable future. (American Embassy, Mexico, D.F., July 29, 1960.)



ALGAE BANK GETS FUNDS FOR NEXT FIVE YEARS

An algae "bank" of more than 800 strains, studied as a possible food to meet the threat of overpopulation, will be supported by a grant of \$34,600 for the next five years from the National Science Foundation. The research is being carried on at Indiana University.

The algae are grown in glass tubes in a constant temperature under continuous fluorescent lighting. They are studied as a food and used in genetics research. They may possibly be grown on future space flights as food for space travelers. Science News Letter, April 2, 1960.

FEDERAL ACTIONS

**Department of Health,
Education, and Welfare**

FOOD AND DRUG ADMINISTRATION

EFFECTIVE DATE OF FOOD ADDITIVES STATUTE IS EXTENDED FOR ADDITIONAL ITEMS:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, has designated (Federal Register, August 4, 1960) additional food additives which can be used in foods either directly or indirectly under certain specified conditions for a period of 1 year from March 6, 1960, or until regulations have been issued establishing or denying tolerances or exemptions. On the basis of data supplied, the Commissioner has found that no undue risk to the public health is involved and that conditions exist that make necessary the prescribing of an additional period of time for obtaining tolerances or denials of tolerances or for granting exemption from tolerances.

One list contains 18 and a second list an additional 18 items (including sodium nitrate or a combination of sodium nitrate and sodium nitrite) as direct additives to food; a third list contains about 125 items as indirect additives to food. In many instances the tolerance limit is given, where applicable, and the specified uses or restrictions are specified.

Also, the Commissioner proposes to add about 39 nutrients incorporated in dietary food supplements.

* * * * *

PROPOSAL TO ADD CERTAIN SYNTHETIC FLAVORINGS TO SUBSTANCES RECOGNIZED AS SAFE:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, proposed to amend the food additives regulations to exempt certain synthetic fla-

voring substances used as additives from the requirement of tolerances by adding them to the list of substances generally recognized as safe (Federal Register, August 12, 1960.)

The list of synthetic flavorings contains about 27 items.

* * * * *

EFFECTIVE DATE OF FOOD ADDITIVES STATUTE EXTENDED FOR SYNTHETIC FLAVORINGS:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, has designated (Federal Register, August 13, 1960) synthetic flavoring substances and adjuncts which can be used in foods either directly or indirectly under certain specified conditions for a period of 1 year from March 1, 1960, or until regulations have been issued establishing or denying tolerances or exemptions. On the basis of data supplied, the Commissioner has found that no undue risk to the public health is involved and that conditions exist that make necessary the prescribing of an additional period of time for obtaining tolerances or denials of tolerances or for granting exemption from tolerances.

The list contains hundreds of synthetic flavoring substances and adjuncts used as direct additives to food.



Department of the Interior

FISH AND WILDLIFE SERVICE

FEDERAL CODE OF REGULATIONS FOR FISH AND WILDLIFE REVISED:

A revision of Title 50, Code of Federal Regulations, which contains all regulations pertaining to fish and wildlife as administered by the U. S. Fish and Wildlife Service and its two bureaus--Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife--appeared in the September 1, 1960, Part II issue of the Federal Register.

Chapter I covers the regulations of the Bureau of Sport Fisheries and Wildlife and includes the following subchapters: general provisions; hunting and possession of wildlife; the National Wildlife Refuge System; management of Wildlife Research Areas; management of Fisheries Conservation Areas; and Federal Aid to States in fish and wildlife restoration.

Chapter II covers the regulations of the Bureau of Commercial Fisheries and includes the following subchapters: general provisions; North Pacific commercial fisheries; aquatic mammals other than whales; whaling; Northwest Atlantic commercial fisheries; aid to fisheries; processed fishery products, processed products thereof, and certain other processed food products.

Chapter III covers international regulatory agencies (fishing and whaling) and includes the following subchapters: International Pacific Halibut Commission; International Whaling Commission.

* * * *

UNITED STATES WHALING REGULATIONS BROUGHT UP TO DATE:

The provisions of the whaling regulations, as originally embodied in the schedule annexed to the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946, by the United States and certain other Governments have been amended several times by the International Whaling Commission. The last amendments were made in October 1959 and January 1960. Therefore, the United States whaling regulations, as last amended on October 5, 1959, and January 3, 1960, have been edited to conform in numbering, internal references, and similar items to regulations of the Administrative Committee of the Federal Register, but no changes have been made in the substantive provisions. The regulations are applicable to nationals and whaling enterprises of the United States.

The regulations as amended and republished appeared in the August 17, 1960, Federal Register. The regulations cover inspection; killing of gray or white whales prohibited; killing of calves or suckling whales prohibited; operation of factoryships limited; closed area for factoryships in Antarctic; limitations on the taking of humpback whales; closed seasons for pelagic whaling for baleen and sperm whales; minimum size limits; closed seasons for land stations; use of factoryships in waters other than south of 40° S. latitude; limitations

on processing of whales; prompt processing required; remuneration of employees; submission of laws and regulations; submission of statistical data; factoryship operations within territorial waters; and definitions.

Note: See Commercial Fisheries Review, June 1960 p. 68, May (1960) p. 71.

* * * *

BUREAU OF COMMERCIAL FISHERIES

QUALITY STANDARDS ESTABLISHED FOR FROZEN SHRIMP:

Voluntary standards for the production of high-quality, frozen, raw, headless shrimp have been approved, the Department of the Interior announced August 11, 1960. The standards were published in the Federal Register of August 11, 1960, and became effective September 10, 1960. The notice of intention to establish standards was carried in the Federal Register on May 7, 1960.

The standards were developed by the U. S. Bureau of Commercial Fisheries after months of research. Well-advertised public meetings in Los Angeles, New Orleans, Chicago, Jacksonville, and Corpus Christi, were attended by interested industry groups, consumer representatives, and representatives of the National Fisheries Institute. Suggestions made as a result of these and other contacts were all given full consideration and many of them were adopted.

Shrimp is the most valuable fishery resource of the United States. In 1959, the United States catch amounted to about 142 million pounds, with the heads removed. More than 80 percent of the catch was landed at Gulf of Mexico ports from Texas to Florida, about 11 percent at South Atlantic ports, and about eight percent at Pacific Coast ports. Texas was the biggest producing state, followed by Louisiana and Florida. The shrimp catch in 1959 was valued at nearly 60 million dollars to the fishermen.

Acceptance of the quality standards by individual firms is entirely voluntary. Firms with USDI continuous inspection service will have the right to so inform the consumer by appropriate markings on the product package.

Quality standards have already been established for frozen fish sticks, raw frozen breaded shrimp, frozen raw halibut steaks, frozen haddock fillets, cod fillets, rawbreaded fish portions, frozen fish blocks, and frozen salmon steaks.

The U. S. Bureau of Commercial Fisher-ies also announces that 34 processing firms

now have the right to use the Department of the Interior shields of quality.

Title 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

SUBCHAPTER K—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 182—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW HEADLESS SHRIMP¹

On page 4114 of the *FEDERAL REGISTER* of May 7, 1960, there was published a notice and text of a proposed new Part 182 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Raw Headless Shrimp under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested parties were given until June 6, 1960, to submit written comments, suggestions or objections with respect to the proposed new part. Comments were received and considered and the proposed new part is hereby adopted with minor changes and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the *FEDERAL REGISTER*.

Dated: August 5, 1960.

FRED G. AANDAHL,
Acting Secretary of the Interior.

PRODUCT DESCRIPTION, GRADES AND SIZES

Sec.		Product description.
182.1		Grades of frozen raw headless shrimp.
182.3		Sizes of frozen raw headless shrimp.

FACTORS OF QUALITY AND GRADE

182.11 Ascertaining the grade.

DEFINITIONS AND METHODS OF ANALYSIS

182.21 Definitions and methods of analysis.

LOT CERTIFICATION TOLERANCES

182.25 Tolerances for certification of officially drawn samples.

SCORE SHEET

182.31 Score sheet for frozen raw headless shrimp.

AUTHORITY: §§ 182.1 to 182.31 issued under sec. 6(a), Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e), and sec. 205(b), Agricultural Marketing Act of August 14, 1946, as amended (7 U.S.C. 1624(b)).

PRODUCT DESCRIPTION, GRADES AND SIZES

§ 182.1 Product description.

Frozen raw headless shrimp are clean, wholesome, headless, shell-on shrimp of the regular commercial species. They are sorted for size, packed, and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product.

§ 182.2 Grades of frozen raw headless shrimp.

(a) "U.S. Grade A" or "U.S. Fancy" is the quality of frozen raw headless shrimp

¹Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

of a single commercial count that possess a good flavor and odor, that are of a reasonably uniform color, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 90 points.

(b) "U.S. Grade B" or "U.S. Good" is the quality of frozen raw headless shrimp of a single commercial count that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 80 points.

(c) "U.S. Grade C" or "U.S. Commercial" is the quality of frozen raw headless shrimp of a single commercial count that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 70 points.

(d) "Substandard" is the quality of frozen raw headless shrimp that fail to meet the requirements of "U.S. Grade C" or "U.S. Commercial."

§ 182.3 Sizes of frozen raw headless shrimp.

The average weight and number of shrimp per pound (count) of frozen raw headless shrimp are not factors of quality in determining the grade of the product. However the degree of conformity of the weights of the individual shrimp to the average weight of shrimp in the sample is rated since it is a factor affecting the utility of the product. Descriptive size names are not recommended. The commercial count (number per pound) and descriptive size names, if used, shall conform to one of the following categories:

Commercial count—Number of shrimp per pound	Number of shrimp per pound (average)		Descriptive size name
	Over	Not over	
Under 10.....	9.0	10.0	Extra colossal.
10-15.....	9.0	15.0	Colossal.
15-20.....	15.0	20.0	Extra jumbo.
20-25.....	20.0	25.0	Jumbo.
25-30.....	25.0	30.0	Extra large.
30-35.....	30.0	35.0	Large.
35-42.....	35.0	42.0	Medium large.
42-50.....	42.0	50.0	Medium.
50-60.....	50.0	60.0	Small.
60-70.....	60.0	70.0	Extra small.
Over 70.....	70.0	70.0	Tiny.

FACTORS OF QUALITY AND GRADE

§ 182.11 Ascertaining the grade.

(a) General. In addition to considering other requirements outlined in the standards, the grade is ascertained by observing the product in the frozen, thawed, and cooked states and is evaluated by considering the following:

(1) *Factors rated by score points.* The quality of the product with respect to factors scored is expressed numerically. Factors rated by score points are: dehydration; deterioration; black spot on shell or loose membrane only; black spot on meat; broken, damaged and pieces of shrimp; legs, loose shell, and flippers; heads an unacceptable shrimp; extraneous materials; uniformity of size; and the texture of the cooked product.

Cumulative point deductions from the maximum possible score of 100 are assessed for variations of quality for each factor in accordance with the schedule in Table I. The minimum score is 0.

(2) *Factor not rated by score points.* The factor of "flavor and odor" is evaluated organoleptically after the product has been cooked in a suitable manner, and is defined as follows:

(i) *Good flavor and odor.* "Good flavor and odor" (essential requirement for a Grade A product) means that the product has the good flavor and odor characteristic of freshly caught, chilled shrimp and is free from off-flavors and off-odors of any kind. The presence of iodoform-like flavor and odor is not to be construed as off-flavor and off-odor.

(ii) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of Grade B and Grade C products) means that the product may be somewhat lacking in the good flavor and odor characteristic of freshly caught, chilled shrimp but is free from objectionable off-flavors and objectionable off-odors of any kind.

DEFINITIONS AND METHODS OF ANALYSIS

§ 182.21 Definitions and methods of analysis.

(a) "Count," or number of shrimp per pound, is determined by dividing the number of shrimp in the package by the actual net weight in pounds of the shrimp.

(b) "Net weight" of the shrimp is determined as follows:

(i) *Equipment needed.* (1) Container, 4-gallon or more capacity;

(ii) Source of running water that can be maintained at 75°–85° F.; hose of sufficient length to reach the bottom of the container;

(iii) Balance accurate to 0.01 ounce, or 0.1 gram;

(iv) U.S. standard wire sieve, ASTM No. 20, 12-inch diameter.

(2) *Procedure.* Place the frozen shrimp in the 4-gallon container into which fresh water of a temperature from 75° to 85° F. is introduced from the bottom at a flow of approximately six gallons per minute. After any glaze has been removed and the shrimp separate easily, empty the contents of the container through the tared sieve, spreading the shrimp out evenly. Tilt the sieve at approximately a 45-degree angle to facilitate drainage; drain the shrimp for 2 minutes; and then weigh the sieve and contents. The net weight is the weight of the sieve and contents minus the weight of the sieve.

(c) "Cooked in a suitable manner" means that a thawed sample of the product has been cooked by the following method:

Place 2 to 4 ounces of peeled and rinsed shrimp in a bailable plastic bag with $\frac{1}{4}$ -cup of salt solution (1 teaspoon salt dissolved in 1 pint or 2 cups of water). Add a 2-ounce stainless steel weight or snap a large clip on bottom of bag. Suspend the bag in a kettle of boiling water and return the water to a boil as rapidly as possible. (More than one sample may be cooked at a time, as long as the water will return to a boil within 3 minutes). After the water is boiling, cook according to the following timetable:

Count of shrimp—Number per pound	Cooking time (minutes)
Up to 15.....	12
16 to 35.....	9
Over 35.....	6

Remove from bag, drain, and cool to approximately room temperature (do not refrigerate) for evaluation of flavor and odor.

(d) "Dehydration" refers to the occurrence of a whitish area on the exposed ends of the shrimp, due to the drying of the affected area, and to a generally dehydrated appearance of the meat after the shell is removed.

(e) "Deterioration" refers to any detectable change from the normal good quality of freshly caught shrimp. It is evaluated by noting deviations of the odor of the thawed product from the normal odor of freshly caught shrimp.

(1) "Slight deterioration" means that the shrimp lack the pleasant odor characteristic of freshly caught shrimp.

(2) "Moderate deterioration" means that the shrimp have slight off-odors.

(3) "Marked deterioration" means that the shrimp have definite off-odors, but are not spoiled.

(4) "Excessive deterioration" means that the shrimp have a definite odor of spoilage. Deductions in this category are made for individual shrimp which are affected.

(f) "Black spot on the shell or loose membrane only" refers to blackened areas at least moderately affecting the appearance of the shrimp.

(1) "Moderately affecting" means that the black spot which occurs at the shell joints extends at least one-third of the circumference of the shrimp at the particular location at which it occurs, and black spot which occurs as a circular area exceeds one-eighth inch in diameter for 31/35 count shrimp or is proportionately larger or smaller for respectively larger or smaller shrimp.

(g) "Black spot on the meat" refers to any darkened area that is present on the shrimp flesh.

(h) "Broken" refers to a shrimp having a break in the flesh greater than one-third of the thickness of the shrimp at the particular location at which it occurs.

(i) "Damaged" refers to a shrimp that is crushed or mutilated so as to materially affect its appearance.

(j) "Piece" refers to any portion of shrimp that contains less than five segments.

(k) "Legs" refers to walking legs only, not swimmers, or to portions of the head (cephalothorax) with legs and which may be either loose or attached to a shrimp.

(l) "Loose shell" refers to any piece of shell which is completely detached from the shrimp except paper-thin shell from soft-shelled shrimp.

(m) "Flipper" refers to a tail fin, sometimes including the last shell segment but containing no meat.

(n) "Head" means any portion of head (cephalothorax) large enough to contain an eye and which may be either loose or attached to a shrimp.

(o) "Unacceptable shrimp" refers to abnormal or diseased shrimp.

(p) "Extraneous material" means any material in the package which is not shrimp material.

(q) "Uniformity of size" is evaluated by computing the actual count per pound of the shrimp in the sample, and then determining, by weighing individual shrimp, the number of shrimp that are slightly large, slightly small, exceedingly large, or exceedingly small for that particular count per pound.

(1) "Slightly large" means that a shrimp is more than 25 percent, but not more than 35 percent larger, by weight, than a shrimp of the actual count per pound.

(2) "Exceedingly large" means that a shrimp is more than 35 percent larger, by weight, than a shrimp of the actual count per pound.

(3) "Slightly small" means that a shrimp is more than 25 percent, but not more than 35 percent smaller, by weight, than a shrimp of the actual count per pound.

(4) "Exceedingly small" means that a shrimp is more than 35 percent smaller, by weight, than a shrimp of the actual count per pound. For use in computing the uniformity of size factor, weights of individual shrimp are given in Table II.

(r) "Texture" defect refers to an undesirable toughness and/or dryness and/or mushiness of the shrimp examined in the cooked state.

Lot CERTIFICATION TOLERANCES

§ 182.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 170 of this chapter (regulations governing processed fishery products, 23 F.R. 5064, July 3, 1958).

With respect to conformance with the declared commercial count, the lot shall be considered to be of the declared count if the number of deviant units in the sample does not exceed the acceptance number prescribed for the sample size in Part 170 of this chapter. If a lot fails to meet the requirements of any specific commercial count, it shall be marked a mixed lot and shall not be graded.

SCORE SHEET

§ 182.31 Score sheet for frozen raw headless shrimp.

GENERAL

Label.....	
Size and kind of container.....	
Container mark or identification.....	
Sign of lot.....	
Number of samples.....	
Declared count per pound.....	
Actual net weight (ounces).....	
Actual count per pound.....	
Descriptive size name.....	

Scored factors (table I)	Deductions
Frozen and thawed:	
1. Dehydration.....	
2. Deterioration.....	
3. Black spot on shell or loose membrane only.....	
4. Black spot on meat.....	
5. Broken, damaged, and pieces.....	
6. Legs, loose shell, and flippers.....	
7. Heads and unacceptable shrimp.....	
8. Extraneous material.....	
9. Uniformity of size.....	
Cooked:	
10. Texture.....	
Total deductions.....	
Rating for scored factors (100 minus total deductions).....	
Flavor and odor.....	
Final grade.....	

TABLE I—SCHEDULE OF DEDUCTIONS FOR FACTORS RATED BY SCORE POINTS¹

State	Factor	Description of quality variation			Deduct
		Dehydrated—exposed ends	Deterioration of meat	Thawed state	
Frozen and thawed	Dehydration.....	Frozen state	Thawed state	Thawed state	
		Up to 5 percent.....	None.....	None.....	0
		5.1–15.0 percent.....	Up to 2.0 percent.....	Slight.....	1
		Over 15.0 percent.....	(2.1–5.0 percent.....) (Over 5.0 percent.....)	Moderate..... Marked.....	11
	Deterioration.....	(Percent by count of total sample.) Apply the one highest deduction only.			
		Off-odor, overall sample:			
		Slight.....			1
		Moderate.....			2
		Marked.....			5
		Any excessive, each 1 percent or fraction (percent by count). Apply the one highest deduction only.			
Thawed	Black spot on shell or loose membrane only.....	Shell affected, but not meat:			
		Not over 5 percent.....			1
		Each additional 5 percent, or fraction (percent by count).....			5
	Black spot on meat.....	None.....			0
		Not over 3 percent.....			1
		2.1–5.0 percent.....			2
		Each additional 5 percent, or fraction (percent by count).....			5
	Broken, damaged, and pieces.....	Not over 1 percent.....			0
		1.1–3.0 percent.....			1
		Each additional 3 percent, or fraction (percent by weight).....			5
Cooked	Legs, loose shell, and flippers.....	Not over 3 percent.....			0
		Each additional 3 percent, or fraction (percent by count).....			2
	Heads and unacceptable shrimp.....	Not over 1 percent.....			0
		Each additional 1 percent, or fraction (percent by count).....			2
	Extraneous material.....	1 piece.....			1
		2 pieces.....			2
		over 2 pieces.....			4
	Uniformity of size.....	Slightly large and slightly small: Each 3 percent, or fraction.....			1
		Exceedingly large and exceeding small: Each 3 percent, or fraction (percent by count—based on actual count per pound of sample).....			3
Cooked	Texture.....	Tough, dry, or mushy:			
		Slight.....			2
		Moderate.....			4
		Excessive.....			11

¹ This schedule of point deductions is based on the examination of sample units composed of: (a) the contents of an entire package or (b) sufficient packages to provide a sample unit of 2 pounds or more, declared net weight.

RULES AND REGULATIONS

TABLE II—WEIGHTS OF NON-UNIFORM SHRIMP
[Ounces]

Count per pound	Exceedingly large	Slightly large	Slightly small	Exceedingly small
8.....	Over- 2.70	Over- 2.50	Under- 1.00	Under- 0.94
9.....	2.40	2.22	1.33	1.16
10.....	2.16	2.00	1.20	1.04
11.....	1.96	1.82	1.00	0.94
12.....	1.80	1.67	1.00	0.87
13.....	1.66	1.54	0.92	.80
14.....	1.54	1.43	.86	.74
15.....	1.44	1.33	.80	.69
16.....	1.35	1.25	.75	.65
17.....	1.27	1.18	.71	.61
18.....	1.19	1.11	.67	.58
19.....	1.14	1.05	.63	.50
20.....	1.08	1.00	.60	.52
21.....	1.03	.95	.57	.40
22.....	.98	.91	.54	.35
23.....	.94	.87	.52	.45
24.....	.90	.83	.49	.43
25.....	.86	.80	.48	.42
26.....	.83	.77	.48	.40
27.....	.80	.74	.44	.35
28.....	.77	.71	.43	.37
29.....	.74	.69	.41	.36
30.....	.72	.67	.40	.35
31.....	.70	.64	.39	.34
32.....	.67	.62	.38	.32
33.....	.65	.61	.36	.33
34.....	.64	.59	.35	.30
35.....	.62	.57	.34	.30
36.....	.60	.56	.33	.29
37.....	.58	.54	.32	.28
38.....	.57	.53	.32	.27
39.....	.55	.51	.31	.27
40.....	.54	.50	.30	.26
41.....	.53	.49	.29	.23
42.....	.51	.48	.29	.25
43.....	.50	.47	.28	.24
44.....	.49	.46	.27	.24
45.....	.48	.44	.27	.23
46.....	.47	.44	.26	.23
47.....	.46	.43	.26	.23
48.....	.45	.42	.25	.22
49.....	.44	.41	.24	.21
50.....	.43	.40	.24	.21
51.....	.42	.39	.24	.20
52.....	.42	.38	.23	.20
53.....	.41	.37	.23	.20
54.....	.40	.37	.22	.19
55.....	.39	.36	.22	.19
56.....	.39	.36	.21	.18
57.....	.38	.35	.21	.18
58.....	.37	.34	.20	.18
59.....	.37	.34	.20	.18
60.....	.36	.33	.20	.17
61.....	.35	.33	.20	.17
62.....	.35	.32	.19	.17
63.....	.34	.32	.19	.16
64.....	.34	.31	.19	.16
65.....	.33	.31	.18	.16
66.....	.33	.30	.18	.16
67.....	.32	.30	.18	.16
68.....	.32	.29	.18	.15
69.....	.31	.29	.17	.15
70.....	.31	.28	.17	.15
71.....	.30	.28	.17	.15

ALTERNATE TABLE II—WEIGHTS OF NON-UNIFORM SHRIMP
[Grams]

Count per pound	Exceedingly large	Slightly large	Slightly small	Exceedingly small
8.....	Over- 78.5	Over- 70.9	Under- 42.5	Under- 36.3
9.....	65.0	62.9	37.7	32.9
10.....	61.2	58.7	34.0	29.5
11.....	56.6	51.6	30.9	26.6
12.....	51.0	47.3	26.4	24.7
13.....	47.1	43.7	26.1	22.7
14.....	43.7	40.5	24.4	21.0
15.....	42.5	37.7	22.7	19.6
16.....	38.3	35.4	21.3	18.4
17.....	35.0	33.4	20.1	17.3
18.....	33.7	31.5	19.0	16.4
19.....	30.5	28.5	17.9	15.6
20.....	30.6	28.4	17.0	14.7
21.....	29.2	26.9	16.2	14.2
22.....	27.4	25.6	15.3	13.5
23.....	25.6	23.7	14.7	12.8
24.....	23.8	22.5	14.2	12.3
25.....	24.4	22.7	13.6	11.9
26.....	22.5	21.8	13.0	11.3
27.....	22.7	21.0	12.5	10.3
28.....	21.8	20.1	12.2	10.5
29.....	21.0	19.6	11.6	10.2
30.....	20.4	19.0	11.3	9.9
31.....	19.8	18.1	11.0	9.6
32.....	19.6	17.6	10.8	9.2
33.....	18.4	17.3	10.2	8.9
34.....	18.1	16.7	9.9	8.6
35.....	17.6	16.2	9.6	8.4
36.....	17.0	15.9	9.4	8.2
37.....	16.4	15.8	9.1	7.9
38.....	16.2	15.0	9.0	7.7
39.....	15.6	14.5	8.8	7.6
40.....	15.3	14.2	8.8	7.4
41.....	15.0	13.9	8.3	7.2
42.....	14.4	13.8	8.1	7.0
43.....	14.2	13.3	7.9	6.9
44.....	13.9	13.0	7.7	6.7
45.....	13.6	12.5	7.6	6.6
46.....	13.3	12.3	7.4	6.4
47.....	13.0	12.0	7.2	6.3
48.....	12.8	11.8	7.1	6.2
49.....	12.4	11.8	6.9	6.0
50.....	12.2	11.8	6.8	5.9
51.....	11.9	11.0	6.8	5.7
52.....	11.6	10.8	6.5	5.7
53.....	11.3	10.5	6.5	5.7
54.....	11.1	10.5	6.2	5.4
55.....	11.1	10.3	6.2	5.4
56.....	11.1	10.3	6.2	5.4
57.....	11.1	10.3	6.0	5.1
58.....	10.8	9.9	6.0	5.1
59.....	10.5	9.6	5.9	5.1
60.....	10.3	9.4	5.7	4.8
61.....	9.9	9.4	5.7	4.8
62.....	9.9	9.1	5.4	4.8
63.....	9.6	9.1	5.4	4.5
64.....	9.6	9.1	5.4	4.5
65.....	9.4	8.8	5.4	4.5
66.....	9.4	8.8	5.4	4.5
67.....	9.1	8.5	5.1	4.5
68.....	9.1	8.2	5.1	4.5
69.....	9.1	8.2	5.1	4.5
70.....	8.8	7.9	4.8	4.5
71.....	8.5	7.9	4.8	4.5

Note: Also see *Commercial Fisheries Review*, July (1960) p. 82.

* * * * *

PROHIBITION EXTENDED ON
HIGH-SEAS NET FISHING FOR
SALMON IN NORTH PACIFIC:

Salmon fishing with nets will be prohibited to United States nationals on the high seas of the entire North Pacific Ocean and the Bering Sea north of 48° 30' N. latitude as the result of regulations issued in the *Federal Register* of August 16, 1960.

The notice of intention was carried in the *Federal Register* of June 9, 1960. Although

interested persons were given 30 days in which to submit their written comments, suggestions, or objections, none were received.

This revision of prior regulations extends the prohibited salmon net-fishing area to the west of longitude 175° W. where it has not previously been in effect.

The new regulation, which continues a similar exception in the previous regulation, does not apply to fishing for sockeye salmon

or pink salmon south of latitude 49° N. because control of those species is covered from latitude 49° to 48° by the International Sockeye Salmon Commission.

The revised regulation conforms with a request of Alaska's legislature which, in its Second Session, asked for the stoppage of all salmon fishing by nets on the high seas of the North Pacific Ocean and the Bering Sea.

The regulation as it appeared in the Federal Register of August 16, 1960, follows:

SUBCHAPTER F—NORTH PACIFIC COMMERCIAL FISHERIES
PART 130—NORTH PACIFIC AREA
Salmon Fisheries

On page 5153 of the FEDERAL REGISTER of June 9, 1960, there was published a notice of intention to amend Part 130 of Title 50, Code of Federal Regulations. The purpose of the amendment is to extend the boundaries of the area on the high seas of the North Pacific Ocean where it is prohibited to fish for, or take, salmon with any net; to define the term North Pacific Area; and to retitle Subchapter F.

Interested persons were given 30 days within which to submit their written comments, suggestions or objections with respect to the proposed amendment. No written comments, suggestions or objections have been received and the proposed amendment is hereby adopted without change and is set forth below.

This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

The heading for Subchapter F of Title 50, Code of Federal Regulations, is amended to read: Subchapter F—North Pacific Commercial Fisheries.

Part 130 is amended to read as follows:

Sec.
130.1 Definition.
130.10 Salmon fishing prohibited; exception.

Note: Also see Commercial Fisheries Review, August 1960 p. 77.

* * * * *

UNITED STATES AID IN FISHING VESSEL CONSTRUCTION NOT INCLUDED UNDER MORTGAGE INSURANCE PLAN:

Federal financial assistance given toward the construction of a fishing vessel will not be included in arriving at the "actual cost" of the vessel for mortgage insurance purposes if an amended regulation proposed by the Department of the Interior becomes effective. The proposed amendment was carried in the Federal Register of August 31, 1960. Final action was expected to follow the usual 30-day period granted for comment, suggestions, and objections.

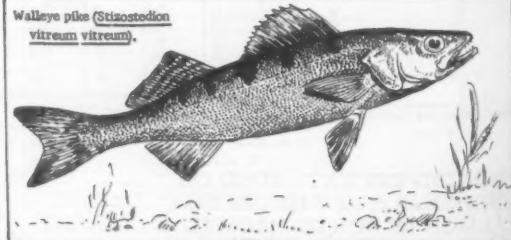
Two laws relative to fishing vessels, recently passed by the Congress and signed by the President, are being activated by the U. S. Bureau of Commercial Fisheries. One of these provides a program of financial assistance to vessels of American registry being constructed in this country. This is to offset the cheaper construction costs abroad and to provide auxiliary vessels in times of national emergency. United States fishermen are not permitted by law to avail themselves of the lower foreign construction costs. The act permits a Federal grant of not more than one-third of the construction cost under certain restricted conditions. An annual authorization of \$2,500,000 is provided, but for the fiscal year ending June 30, 1961, only \$750,000 was appropriated by Congress.

The other law provides for a mortgage insurance program for fishing vessels. Under this legislation, the Department, through the U. S. Bureau of Commercial Fisheries, may guarantee a mortgage up to 75 percent of the "actual cost" of the vessel. The amended regulation specifies that any Federal financial aid given toward the construction of a vessel shall not be included in determining the "actual cost" of the vessel as far as mortgage insurance is concerned.

BUREAU OF INDIAN AFFAIRS

COMMERCIAL FISHING REGULATIONS FOR RED LAKE INDIAN RESERVATION REVISED:

A revision of the commercial fishing regulations for the Red Lake Indian Reservation, Minnesota, appeared in the Federal Register of August 16, 1960. The principal revisions



in the regulations include application of a maximum annual quota to yellow or walleye pike, the main species, rather than to all game fish; and prohibits the taking of yellow and northern pike (pickerel) during their spawning season except for propagation purposes. The remaining revisions are pri-

marily for clarification and to eliminate functions of the Red Lake Fisheries Association from the regulations. The regulations as they appeared in the Federal Register follow:

Title 25—INDIANS

Chapter I—Bureau of Indian Affairs,

Department of the Interior

SUBCHAPTER II—ECONOMIC ENTERPRISES

PART 89—COMMERCIAL FISHING ON RED LAKE INDIAN RESERVATION

On page 4750 of the FEDERAL REGISTER of May 28, 1960, there was published a Notice of Intention to amend Part 89 of Title 25, Code of Federal Regulations. The purpose of this amendment is to revise the regulations in regard to commercial fishing on the Red Lake Indian Reservation, Minnesota. The principal revisions in the regulations include cancellation of a maximum annual quota to walleye pike, the main species, rather than to all game fish; and prohibits the taking of walleye and northern pike during their spawning season except for propagation purposes. The remaining revisions are primarily for the purpose of clarification and to eliminate functions of the Red Lake Fisheries Association from the regulations.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed amendment. No comments, suggestions or objections have been received and the proposed amendment is hereby adopted without change as set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed amendment. No comments, suggestions or objections have been received and the proposed amendment is hereby adopted without change as set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Definitions.

- § 89.1 Definitions.
- § 89.2 Authority to engage in commercial fishing.
- § 89.3 Authority to operate.
- § 89.4 Suspension.
- § 89.5 Disposition of unmarketable fish.
- § 89.6 Spawning season.
- § 89.7 Suspension.
- § 89.8 Penalty.
- § 89.9 Quotas.
- § 89.10 Fishing equipment limitations.
- § 89.11 Royalty.
- § 89.12 Authority to lease.

AUTHORITY: §§ 89.1 to 89.12 issued under 16 U.S.C. 3, 8, U.S.C. 22.

§ 89.1 Definitions.

(a) "Secretary" means the Secretary of the Interior or his authorized representative.

(b) "Council" means the General Council of the Red Lake Band of the Chippewa Indians as recognized by the Secretary of the Interior.

(c) "Association" means the Red Lake Fisheries Association, incorporated under the laws of the State of Minnesota, and whose articles of incorporation and by-laws and any amendments thereto have been approved by the Council and the Secretary of the Interior.

(d) "Member of Association" means as defined in Association By-Laws.

(e) "Commercial Fishing" means the catching of any fish for sale directly or indirectly to others than Indians on the reservations or licensed traders on the reservation for resale to Indians.

(f) "Authority to engage in commercial fishing."

No person shall engage in commercial fishing in the waters of the Red Lakes on the Red Lake Indian Reservation in the State of Minnesota except the Red Lake Fisheries Association, a corporation organized and incorporated under the laws of Minnesota, and its members, and shall do so in accordance with the regulations in this part. The authority hereby granted to the Association and its members to engage in commercial fishing may, at any time, be cancelled and withdrawn and these regulations may be modified and amended.

taking fish of any variety for commercial purposes or propagation, in accordance with such specifications and directions as the manager of the Association may provide.

(f) All nets used in Red Lake Reservation waters must be marked with appropriate tags to be furnished by the Association.

§ 89.11 Royalty.

The Association shall pay five percent of the gross receipts from the sale of fish by the Association to the designated collector.

collector officer of the Bureau of Indian Affairs, which shall be deposited to the credit of the Band in the Treasury of the United States.

§ 89.12 Authority to lease.

The Band, with the approval of the Secretary, may execute a lease or permit on its fisheries plant and hatchery at Redby, Minnesota, to the Association.

FRED A. SEATON,
Secretary of the Interior.

AUGUST 9, 1960.

Note: Also see Commercial Fisheries Review, August 1960 p. 78.



Department of Labor

WAGE AND HOUR DIVISION

INDUSTRY COMMITTEE TO REVIEW WAGE RATES IN PUERTO RICO FOR FISH CANNING INDUSTRY:

The U. S. Department of Labor appointed Industry Committee No. 49-A to recommend hourly wage rates for the Food and Related Industry in Puerto Rico.

The tuna-canning industry in Puerto Rico has a minimum rate of 85 cents an hour. This rate has been in effect since November 17, 1958. The Fair Labor Standards Act authorizes special industry committees to recommend minimum hourly wage rates for Puerto Rican industries operating at or below the \$1.00 an hour statutory minimum that applies on the mainland.



In order to attain the prescribed statutory minimum wage as rapidly as is economically feasible, the industry committee will recommend to the Administrator the highest minimum wage rate or rates which it determines will not substantially curtail employment in the industry, and will not give the industry in Puerto Rico a competitive advantage over the industry in the United States.

Industry Committee No. 49-A held its public hearing on August 15, in the offices of the U. S. Labor Department's Wage and Hour Division, San Juan, Puerto Rico.



Department of State

INTERNATIONAL COOPERATION ADMINISTRATION

FISHERIES GRANTS TO FOREIGN COUNTRIES:

A list of financial grants by the International Cooperation Administration to aid and rehabilitate the fisheries of a number of foreign countries appeared in the August 24, 1960 Congressional Record. Senator Gruening presented the list in the Senate for publication. The fishing projects financed for the 5 fiscal years since fiscal year 1955 follow:

TABLE I.—Agriculture and natural resources		AFRICA	
(II) Fisheries	Fiscal year 1955		
China: Ocean fisheries development	620,000	Ethiopia: Fisheries development project	25,000
Indonesia: Expansion and modernization of marine fisheries	254,700	Liberia: Fresh water fisheries	25,000
Expansion of inland fisheries	21,000	Aid to commercial fisheries	45,000
Pakistan: Fishery development	104,000	Technical assistance—Somalia: Fisheries development	3,000
Thailand: Fisheries	65,000		
Vietnam: Development of inland fisheries	2,000		
Development of marine fisheries	95,000		
NEAR EAST, AFRICA, AND SOUTH ASIA		EUROPE	
Ethiopia: Fisheries survey	32,300	Iceland: Consulting industry team for the fish industry	5,000
India: Project for modernization and expansion of marine and inland fisheries and extension of marine fisheries	275,100	In country	5,000
Libya: Marine and fresh water fisheries	22,000	China (Taiwan): Fisheries development	25,000
Pakistan: Freshwater fisheries	104,000	Indonesia: Republic: Expansion and modernization of marine fisheries	45,000
Turkey: Freshwater fishing associations	20,000	Hawaii: Processing study by country	2,000
Yemen: Project fisheries	23,000		1,000
		Korea: Fisheries development	100,000
Total:	1,431,501	El Salvador: Fisheries	5,000
		Peru: Renewable resource development	100,000
Fiscal year 1956			
NEAR EAST		Total:	5,415,000
China ("Tibetan"):			
Fishery training	5,000	Fiscal year 1956	
Fish propagation (RETHER)	8,000	EAR EAST	
Indonesia: Republic: Expansion and modernization of marine and inland fisheries	100,400	Cameroon: Fisheries development	25,000
Korea: Fishing boat construction	81,000	China (Taiwan): Fisheries development	25,000
Leban: Inland fish culture	15,400	Indonesia: Republic: Expansion and modernization of marine and inland fisheries	45,000
Thailand: Fisheries	72,000	Hawaii: Processing study by country	2,000
Vietnam: Development of inland fisheries	12,000	Korea: Fisheries development	100,000
Development of marine fisheries	60,000	Vietnam: General fisheries development	100,000
NEAR EAST AND SOUTH ASIA			
India: Expansion and modernization of marine and inland fisheries	10,000		
Pakistan: Freshwater fisheries	114,000		
AFRICA			
Egypt: Fresh water fisheries	15,000		
Fisheries development, West Pakistan	12,000		
Fisheries development program (SCIFPA)	12,000		
Turkey: Freshwater fishing associations	10,000		
ASIA			
El Salvador: Fisheries	7,000		
Liberia: Marine and inland fisheries	20,000		
EUROPE			
Iceland: Consulting industry team for the fish industry, 3d country training	4,000	Fiscal year 1956	
Yugoslavia: Fisheries	14,000	EAR EAST	
		Cameroon: Fisheries development	25,000
LATIN AMERICA		China (Taiwan): Fisheries development (JORD)	25,000
El Salvador: Fisheries	15,000	Indonesia: Republic: Expansion and modernization of marine and inland fisheries	45,000
Peru: Fisheries development program (SCIFPA) project fisheries	20,000	Hawaii: Processing study by country	2,000
		Korea: Fisheries development	100,000
Total:	2,355,803	Vietnam: General fisheries development	100,000
Fiscal year 1957			
EAR EAST			
China: Fishing boat rehabilitation program	17,000		
Fisheries	15,000		
Fisheries	600,000		
Indonesia: Expansion and modernization of marine and inland fisheries	14,000		
Korea: Freshwater fisheries	8,314,000		
Thailand: Fisheries	17,000		
Vietnam: Development of inland fisheries	7,000		
Development of marine fisheries	100,000		
NEAR EAST AND SOUTH ASIA			
India: Expansion and modernization of marine and inland fisheries	50,000		
Pakistan: East Pakistan fisheries development	45,000		
Fishery development, East Pakistan	50,000		
Turkey: Freshwater fishing associations	3,000		
AFRICA			
Liberia: Fresh water fisheries	15,000		
Aid to commercial fisheries	20,000		
ASIA			
Morocco: Research in South China Sea and the Gulf of Thailand	100,000		
Total:	3,301,803		
Fiscal year 1957			
EAR EAST			
China: Fishing boat rehabilitation program	17,000		
Fisheries	15,000		
Fisheries	600,000		
Indonesia: Expansion and modernization of marine and inland fisheries	14,000		
Korea: Freshwater fisheries	8,314,000		
Thailand: Fisheries	17,000		
Vietnam: Development of inland fisheries	7,000		
Development of marine fisheries	100,000		
NEAR EAST AND SOUTH ASIA			
India: Expansion and modernization of marine and inland fisheries	50,000		
Pakistan: East Pakistan fisheries development	45,000		
Fishery development, East Pakistan	50,000		
Turkey: Freshwater fishing associations	3,000		
AFRICA			
Liberia: Fresh water fisheries	15,000		
Aid to commercial fisheries	20,000		
ASIA			
Morocco: Research development in South China Sea and Gulf of Thailand	400,000		
Total:	3,301,803		

Treasury Department

COAST GUARD

FISHING VESSELS EXEMPTED FROM ADVANCE ARRIVAL TIME NOTICE:

The exemption of certain vessels from advance notice of time of arrival was announced by the U. S. Coast Guard in the Federal Register of July 29, 1960. Among those exempted are vessels engaged in the fisheries.

The master or agents of every foreign vessel and every documented vessel of the United States except (1) United States vessels engaged in the coastwise trade, (2) United States vessels engaged in the fisheries, or (3) United States yachts shall give at least 24 hours' advance notice of arrival to the Coast Guard Captain of the Port at every port or place where the vessel is to arrive.



Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



ADJOURNMENT: The Eighty-Sixth Congress adjourned "sine die" or finally on September 1, 1960, and a considerable number of bills of interest to fisheries ended up as "unfinished business." These bills will have to be re-introduced in the 87th Congress next year if they are to receive consideration, since all bills not completed during the Second Session of this Congress are "dead" and do not carry over to the Eighty-Seventh Congress which will convene in January 1961. Also, this means that bills if and when re-introduced must go through the entire process of committee consideration, hearings, etc.

The Senate re-opened the short session of the 86th Congress on August 8 and the House reconvened on August 15, 1960. Both Houses had adjourned on July 3, 1960, for a recess of several weeks.



ALASKA FISHERIES TRANSPORT ACT EXTENSION: S. 2669 (Bartlett and Gruening), a bill to extend the period of exemption from inspection under the provisions of section 4426 of the Revised Statutes granted certain small vessels carrying freight to and from places on the inland waters of southeastern Alaska, was introduced in the House on September 9, 1959; referred to the Committee on Interstate and Foreign Commerce. Reported to the Senate March 11, 1960 (S. Rept. No. 1160). Passed Senate March 28, 1960. Referred to the House Merchant Marine and Fisheries Committee March 29, 1960. Reported to the House June 16, 1960 (H. Rept. No. 1886). Rules suspended and passed House on Union Calendar, amended, June 24, 1960. Senate asked for a conference June 29, 1960. House agreed to conference June 30, 1960. Conference report filed July 2, 1960 (S. Rept. 2086). House agreed to conference report August 24, 1960. Senate agreed to conference report August 24, 1960. Signed by the President September 2, 1960 (Public Law 86-688, 74 Stat. 735). Extends Act to December 31, 1962, and it permits certain small vessels (many of them fishing vessels) operated by cooperatives or associations to transport merchandise of members on a nonprofit basis to or from places within the inland waters of southeastern Alaska and Prince Rupert, B. C., or to or from places within said inland waters of the State of Washington. The Act originally was approved August 23, 1958 (72 Stat. 833).

FISH & WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: On September 2, 1960, the President signed S. 1781, a bill to facilitate cooperation between the Federal Government, colleges and universities, the states, and private organizations for cooperative unit programs of research and education relating to fish and wildlife, and for other purposes (Public Law 86-688, 74 Stat. 733). Authorizes the U. S. Fish and Wildlife Service to continue to enter into cooperative agreements for conducting research, training, and demonstration fish and wildlife resources programs.

FOREIGN TRADE EFFECTS ON AMERICAN ECONOMY: H. Res. 629 (Levering), resolution authorizing investigation of effects of foreign trade on American economy, was introduced in the House on August 26; referred to the Committee on Rules. Because of a continuing and growing unrest in certain United States industries because of GATT, because administration of Buy American Act has been detrimental to the American economy, and because there is a continuing and chronic unemployment of about 5 million workers in the United States, the resolution authorizes the chairman of the House Committee on Education and Labor to appoint a committee to start a full investigation of the operations of reciprocal trade agreements, the economic developments under the foreign and mutual aid programs, the rulings and operations of the Buy American Act and the Small Business Administration Act, to determine the effect on the economics of this country; also on the direct or indirect relationship of foreign trade on domestic employment.

H. J. Res. 808 (Robinson), joint resolution to provide for a commission to study and report on the influence of foreign trade upon business and industrial expansion in the United States; introduced in the House August 31, 1960, and referred to the Committee on Ways and Means. Similar to H. Res. 629 in purpose except that H. J. Res. 808 would provide a commission to make the study while H. Res. 629 authorizes the chairman of the House Committee on Education and Labor to appoint a committee to make the investigation.

H. J. Res. 807 (Riehlman) also introduced on August 31 is identical to H. J. Res. 808.

IMPORTED COMMODITY LABELING: H. R. 5054, a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers, on August 26, 1960, was sent to the President for signature. On September 8 the President vetoed the bill. In explanation of the veto, the President asserted that the bill would conflict with the reduction of unnecessary trade barriers, a major objective of United States foreign policy; also that the bill is unnecessary since the Federal Trade Commission now has the authority to require the disclosure of the country of origin of repackaged imported articles whenever the "public interest" is involved. House-passed version provided that imported articles removed from their original containers (which are required to be labeled with the country of origin), repackaged, and offered for sale in a new container, shall be marked to show the country of origin. The Senate-passed version amended the bill by providing that it would not apply in cases where the Secretary of the Treasury finds that compliance with the marking requirements would necessitate such substantial changes in customary trade practices as to cause undue hardship and that repackaging of the article in question is otherwise than for the purpose of concealing the origin of such article.

INTERNATIONAL FOOD AND RAW MATERIALS RESERVE: S. Rept. No. 1922, International Food for Peace Resolution (August 26, 1960, 86th Congress, Second Session, Report from the Committee on Foreign Relations to accompany S. Con. Res. 116, 4 pp., printed. The Committee, after considering S. Con. Res. 114, S. Res. 357, S. Res. 340, and S. Res. 8, which deal with using United States surplus agricultural commodities in food for peace programs, reported S. Con. Res. 116, and original resolution, and recommended passage. Report explains purpose and background of the legislation. The appendix contains a statement from the Acting Secretary of State.

PUBLIC WORKS APPROPRIATIONS, 1961: H. Rept. No. 2181, Public Works Appropriation Bill, 1961 (August 26, 1960, 86th Congress, Second Session, Report from Conference Committee to accompany H. R. 12326, 30 pp., printed. Recommendations of the Conference Committee on the disagreements between the House and Senate versions of the legislation. Includes funds for Fish and Wildlife Service studies of effect of water projects on fish and wildlife and Columbia River fishery programs.

House on August 30 adopted the conference report on H. R. 12326, and sent the legislation to the Senate. H. R. 12326 on August 30 was cleared for President's signature when Senate adopted conference report.

House on September 1 presented to the President for signature H. R. 12326. President signed the bill September 2, 1960 (Public Law 86-700, 74 Stat. 743). Includes funds to permit detailed studies by Fish and Wildlife Service of numerous Corps of Engineers and Bureau of Reclamation projects in the United States as to their effect on fish and wildlife; funds for operation and maintenance by the U. S. Fish and Wildlife Service of the lower Columbia River fisheries development and fish sanctuary program.

SHRIMP IMPORTS: A resolution was adopted by the Senate Committee on Finance in August 1960 directing the United States Tariff Commission to make a thorough investigation of the domestic shrimp industry (including fishing, processing, and other related operations) and of imports of shrimp and shrimp products provided for in paragraph 1761 of the Tariff Act of 1930, and report to the Committee on Finance not later than March 1, 1961.

STATE DEPARTMENT APPROPRIATIONS: H. R. 11666, fiscal 1961 appropriations for the Departments of State and Justice, and the Judiciary. Signed by the President August 31, 1960 (Public Law 86-678, 74 Stat. 555). Includes funds (\$1,875,000) for the United States to meet its obligations in connection with participation in nine international fisheries commissions.

STERN RAMP TRAWLER: H. J. Res. 804 (Westland), joint resolution to authorize the Secretary of Commerce to construct a modern stern-ramp trawler to be used for research purposes and authorizing the appropriation of funds; introduced in the House August 30, 1960, and referred to the Committee on Merchant Marine and Fisheries. Similar to S. J. Res. 216 introduced in the Senate on June 30, 1960. Provides for use of the vessel in the eastern Bering Sea and other North Pacific Ocean areas and includes certain authorities for the Secretary of the Interior.

SUPPLEMENTAL APPROPRIATIONS FY 1961: Second Supplemental Appropriation Bill for 1961 (Hearings before the Committee on Appropriations, United States Senate, 86th Congress, Second Session, on H. R. 13161), 644 pp., printed. Contains statements of various agencies on requests for additional funds for fiscal year 1961, and included are statements by officials of the United States Fish and Wildlife Service for additional Bureau of Commercial Fisheries funds for fishing vessel differential construction subsidy and Eastern Pacific tuna research program; and Bureau of Sport Fisheries and Wildlife funds for emergency repairs to two wildlife refuges.

S. Rept No. 1925, Second Supplemental Appropriation Bill, 1961 (August 27, 1960, 86th Congress, Second Session, Report from Committee on Appropriations to accompany H. R. 13161), 29 pp., printed. Contains amendments and changes to supplemental appropriations for the fiscal year ending June 30, 1961, for several Federal agencies as recommended by the Senate Committee. With reference to additional funds for the Bureau of Commercial Fisheries, the Committee recommended \$300,000 for an expansion of the tuna research programs in the Eastern Pacific instead of the House allowance of \$100,000; for the fishing vessel differential construction subsidy program, the Senate Committee recommended \$1,000,000 instead of the

House allowance of \$500,000. For the Bureau of Sport Fisheries and Wildlife, the Committee recommended \$250,000 for emergency repairs to two wildlife refuges, the same as allowed by the House. The Committee also recommended the inclusion of a provision that the Fish and Wildlife Service be authorized to acquire 20 police-type vehicles.

H. Rept. No. 2211, Second Supplemental Appropriation Bill, 1961 (August 30, 1960, 86th Congress, Second Session, Conference Report to accompany H. R. 13161), 7 pp., printed. Contains recommendations of the Committee of Conference on the amendments of the Senate to H. R. 13161, making supplemental appropriations for the fiscal year ending June 30, 1961, for several Federal agencies. Includes additional funds for the U. S. Bureau of Commercial Fisheries: The Committee agreed to appropriate \$100,000 for the Eastern Pacific tuna research program as proposed by the House instead of \$300,000 as proposed by the Senate; \$750,000 for the fishing vessel construction differential subsidy instead of \$500,000 as proposed by the House and the \$1,000,000 as proposed by the Senate.

House disagreed on August 30 to Senate amendments to H. R. 13161, agreed to conference requested by Senate on August 29, and appointed conferees. Conferees on August 30, in executive session, agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 13161. Committee of Conference reported to House on August 30 H. R. 13161 (H. Rept. No. 2211).

House August 31 adopted conference report on H. R. 13161, and sent the legislation to the Senate. Senate August 31 adopted conference report and cleared the bill for the President. As finally agreed upon in conference, bill includes for the U. S. Bureau of Commercial Fisheries \$100,000 for Eastern Pacific tuna research and \$750,000 for the fishing vessel differential construction subsidy program. For the U. S. Bureau of Sport Fisheries \$250,000 for emergency repair work on two wildlife refuges.

Signed by the President September 8, 1960 (Public Law 86-722, 74 Stat. 821).

WAGES--MINIMUM HOURLY RATE INCREASE: Conferees continued, in executive session, on August 30 to resolve the differences between the Senate- and House-passed versions of H. R. 12677, proposing amendments to the Fair Labor Standards Act, which would raise the minimum wage and cover additional workers. The two versions affect the fishery exemption under the Act differently. Conferees did not reach final agreement, and recessed subject to call, but Congress adjourned and no further action was taken on the bill.

FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES
In Millions of Pounds

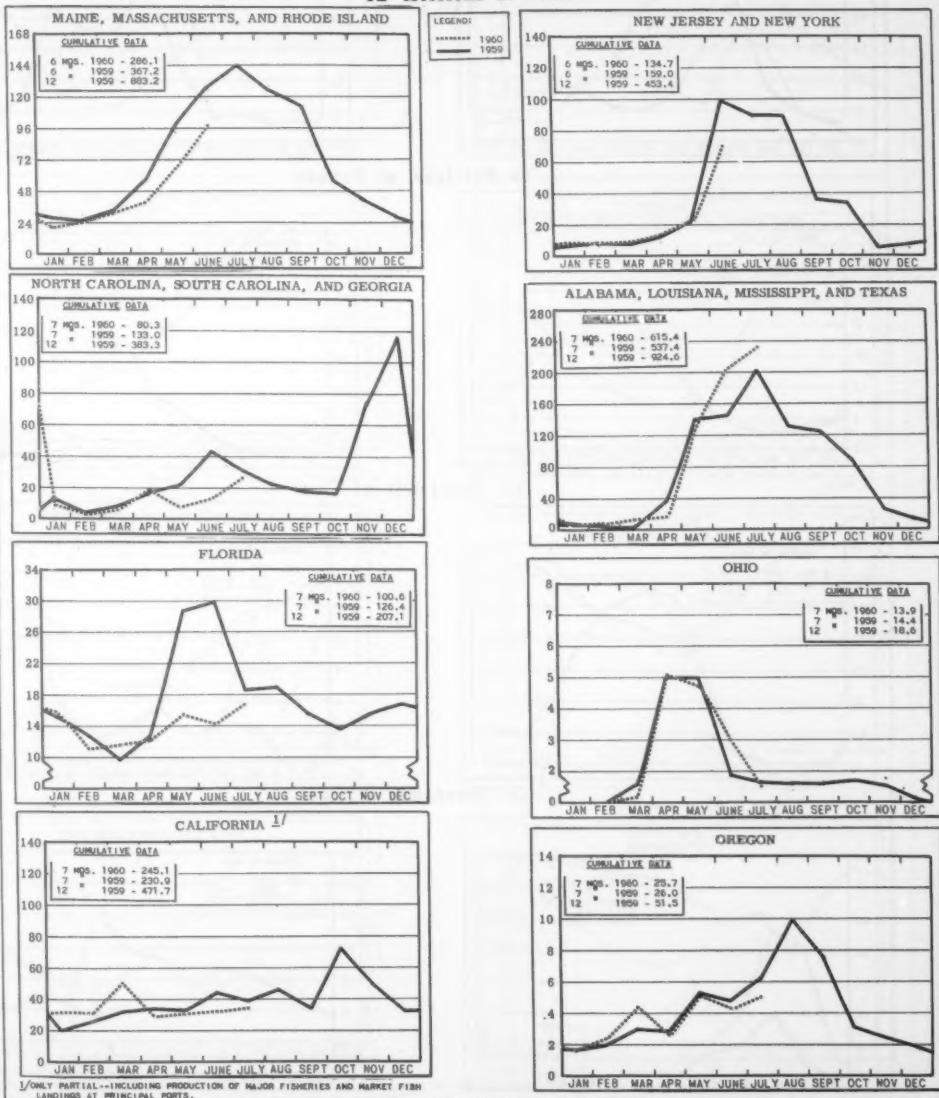
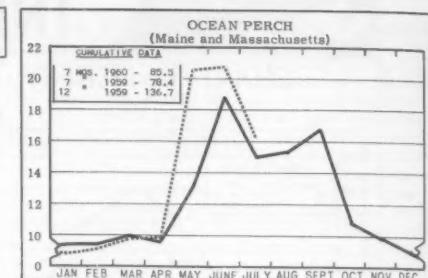
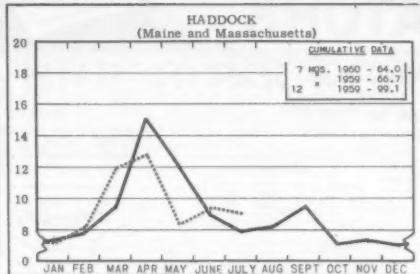
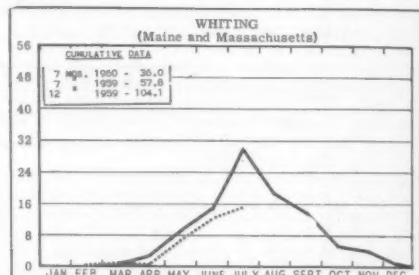
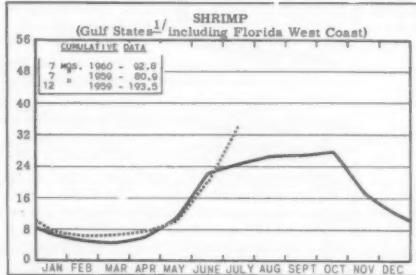


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

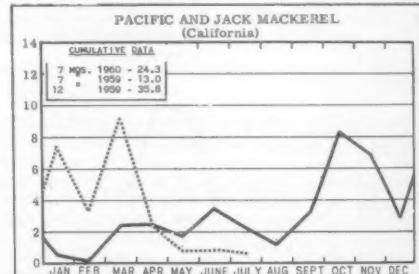
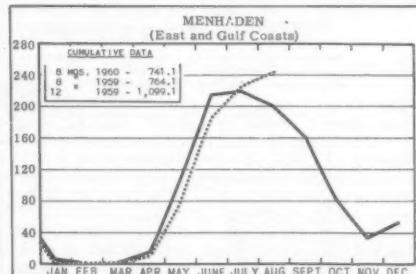


In Millions of Pounds

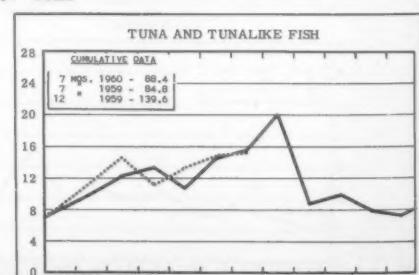
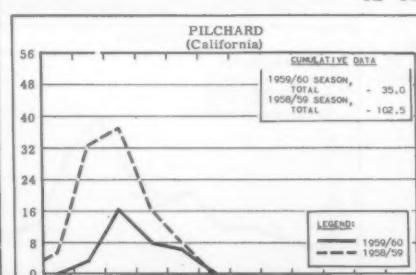


^{1/}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons



**CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS
of FISHERY PRODUCTS ***

In Millions of Pounds

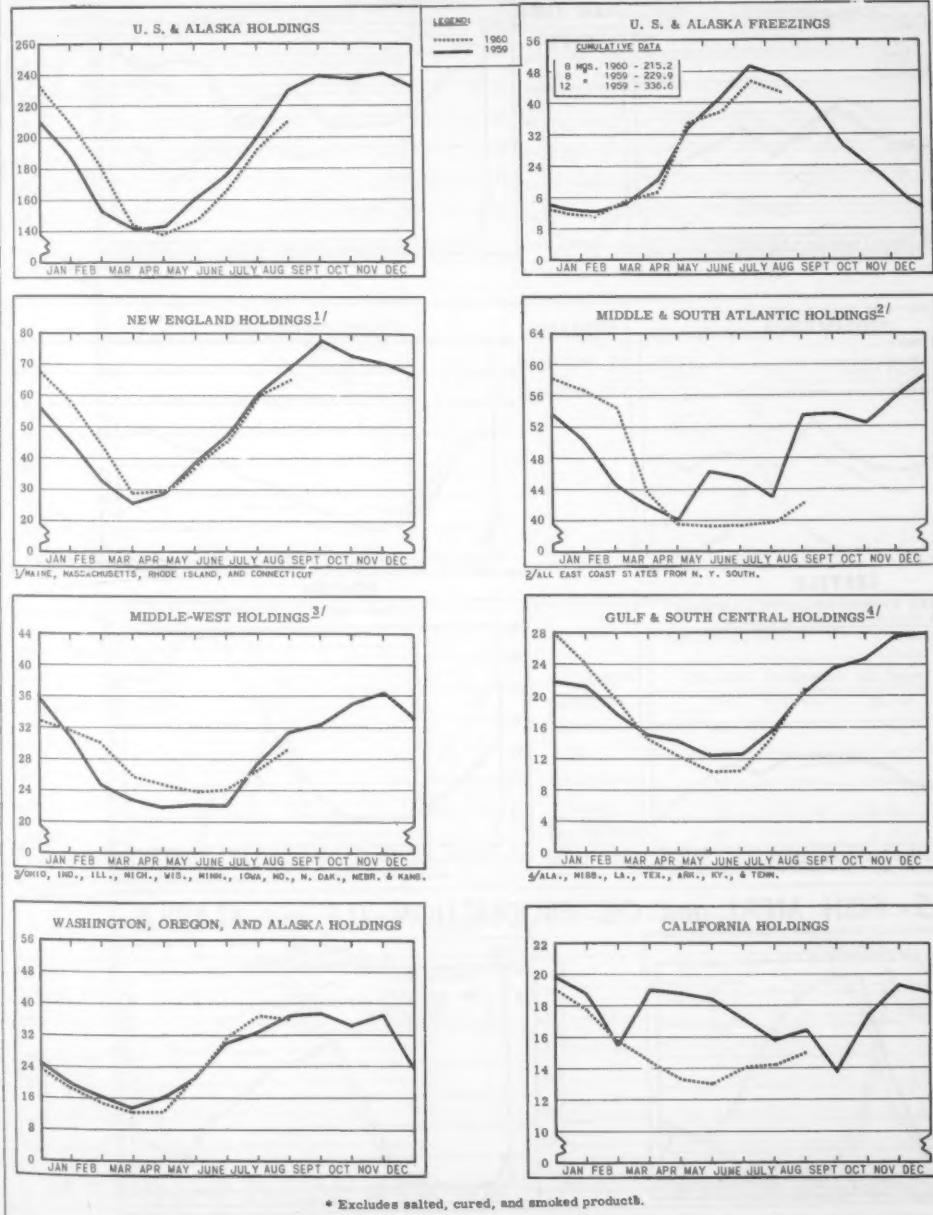
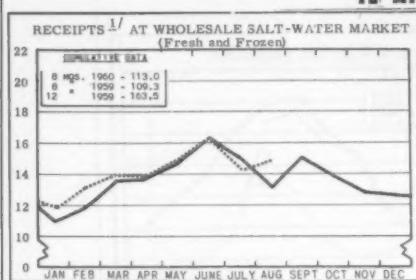


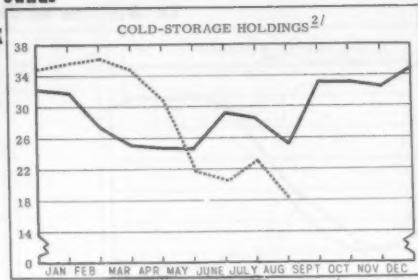
CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

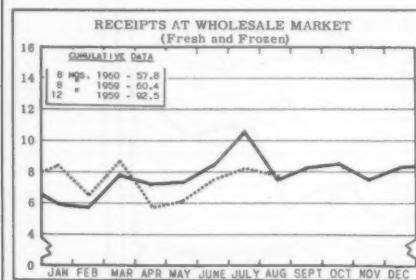


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS
AT NEW YORK CITY.

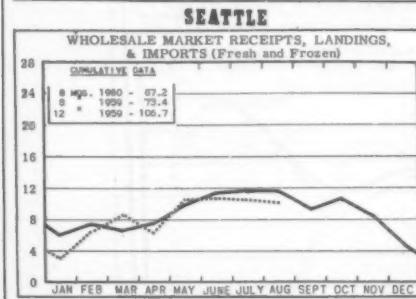
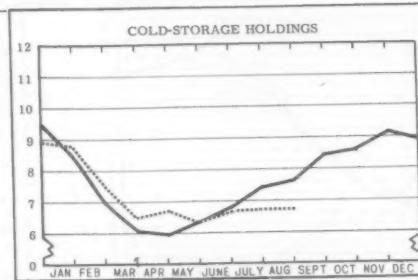
NEW YORK
CITY



^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
1960
1959

SEATTLE

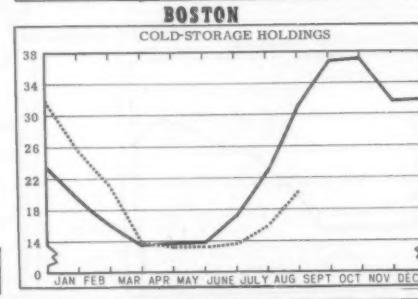


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

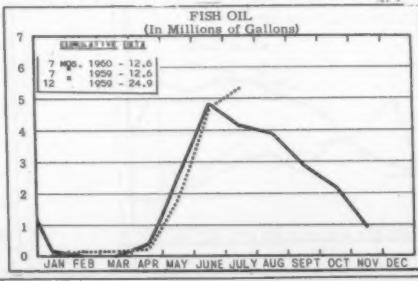
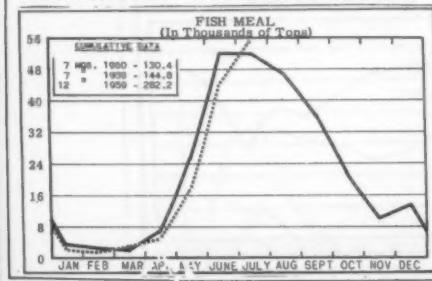
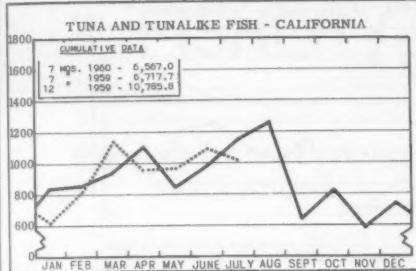
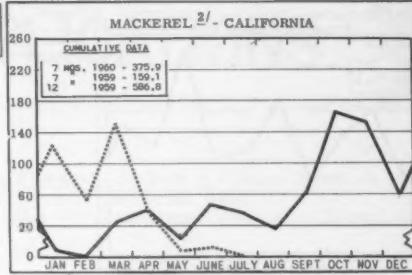


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

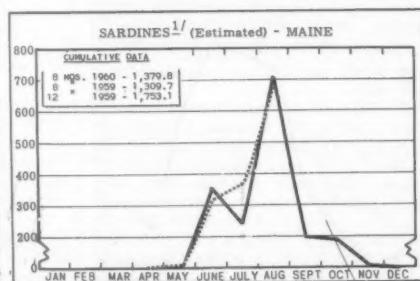
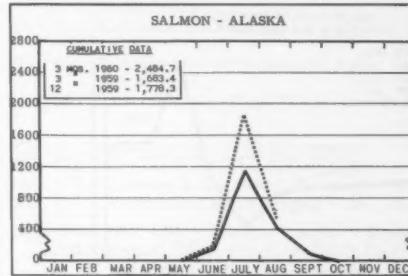
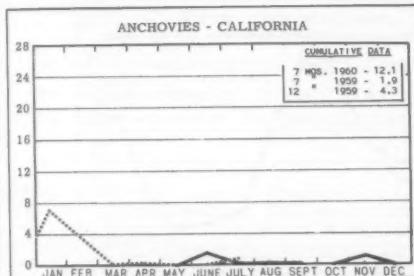
In Thousands of Standard Cases



LEGEND:
1960
1959

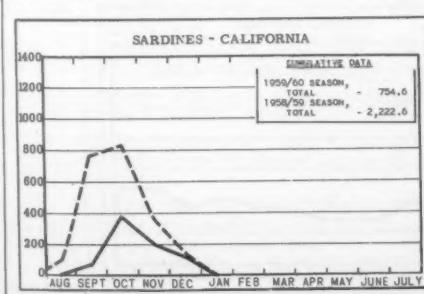


^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES			
Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	½ drawn	3½ oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# ½ tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	½-lb.	8 oz.



LEGEND:
1960/61
1959/60
1958/59

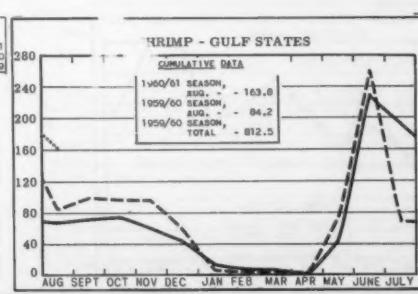
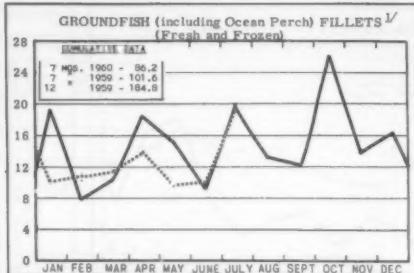
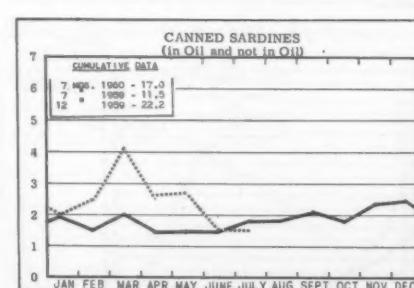
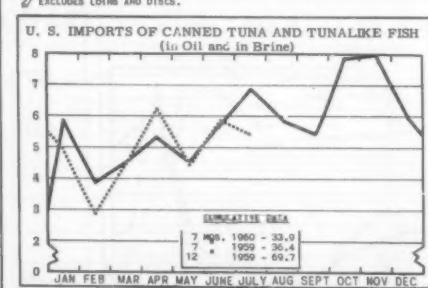
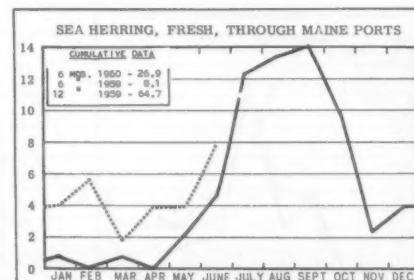
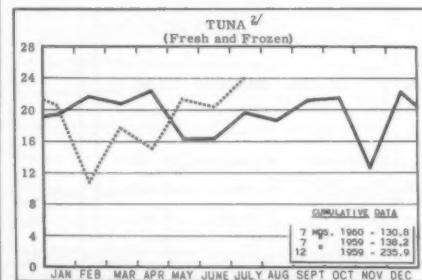
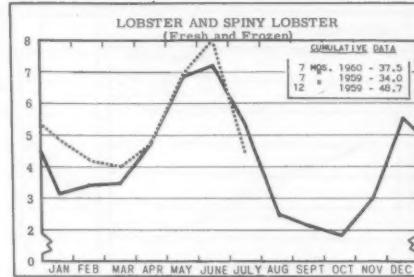
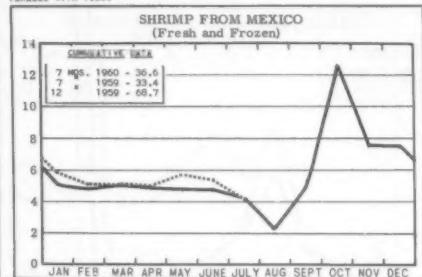
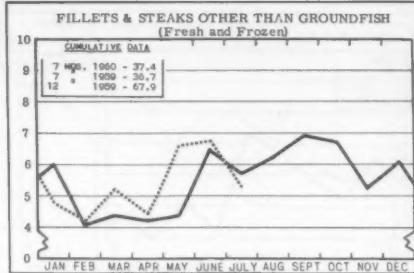


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/}SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
WL - WILDLIFE LEAFLETS.
SSR - FISH, - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SSR - WILDLIFE - SPECIAL SCIENTIFIC REPORTS--WILDLIFE (LIMITED DISTRIBUTION).
SEP - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2336	Hawaii Landings, 1959 Annual Summary, 6 pp.
CFS-2348	Fish Meal and Oil, May 1960, 2 pp.
CFS-2351	Massachusetts Landings, April 1960, 5 pp.
CFS-2352	New York Landings, May 1960, 4 pp.
CFS-2353	California Landings, April 1960, 4 pp.
CFS-2354	North Carolina Landings, June 1960, 3 pp.
CFS-2355	South Carolina Landings, June 1960, 2 pp.
CFS-2356	Texas Landings, May 1960, 3 pp.
CFS-2357	Fish Sticks and Portions, April-June 1960, 3 pp.
CFS-2358	Frozen Fish Report, June 1960, 8 pp.
CFS-2359	Maryland Landings, May 1960, 3 pp.
CFS-2360	Shrimp Landings, April 1960, 6 pp.
CFS-2361	Rhode Island Landings, May 1960, 3 pp.
CFS-2362	Fish Meal and Oil, June 1960, 4 pp.
CFS-2362	(Supplement) - Imports of Fish Meal and Scrap, 1937-1959, 4 pp.
CFS-2364	New Jersey Landings, June 1960, 3 pp.
CFS-2366	Alabama Landings, April 1960, 2 pp.
CFS-2367	Ohio Landings, May 1960, 2 pp.
CFS-2368	Georgia Landings, June 1960, 2 pp.
CFS-2369	South Atlantic Fisheries, 1959 Annual Summary, 6 pp.
CFS-2371	Florida Landings, June 1960, 7 pp.
CFS-2374	Maryland Landings, June 1960, 3 pp.
FL-248	Japanese Whaling in the Bonin Island Area (A Preliminary Report), 16 pp., illus., June 1947.
FL-293	(Revised September 1959) - List of Fishermen's and Fish Shore Workers' Unions in the United States, 8 pp.
FL-498	Culture, Handling and processing of Pacific Coast Oysters, by Lynn G. McKee and Richard W. Nelson, 22 pp., illus., April 1960.

Wholesale Dealers in Fishery Products (Revised):

- SL-21 - California, 1959.
- SL-39 - Tennessee (Mississippi River and Tributaries), 1959.
- SL-40 - Oklahoma (Mississippi River and Tributaries), 1959.
- SL-41 - Arkansas (Mississippi River and Tributaries), 1959.
- SL-43 - Alabama (Mississippi River and Tributaries), 1959.
- SL-45 - Mississippi (Mississippi River and Tributaries), 1959.
- SL-46 - Texas (Mississippi River and Tributaries), 1959.

Firms Manufacturing, 1959 (Revised):

- SL-152 - Oyster Shell Products, 1959.
- SL-155 - Marine Pearl Shell Buttons, 1959.
- SL-161 - Producers of Packaged Fish, 1959.

SSR-Fish. No. 283 - Marquesas Area Fishery and Environmental Data, October 1957-June 1958, by Robert C. Wilson, Eugene L. Nakamura, and Howard O. Yoshida, 110 pp., November 1958.

SSR-Fish. No. 329 - Use of Fish Pituitaries to Induce Spawning in Channel Catfish, by Kermit E. Sneed and Howard P. Clemens, 14 pp., illus., April 1960.

SSR-Fish. No. 336 - Age and Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1956 (With a Brief Review of the Commercial Fishery), by Fred C. June and John W. Reinjes, 42 pp., illus., April 1960.

SSR-Fish. No. 339 - Fishes Taken in the Menhaden Fishery of Alabama, Mississippi, and Eastern Louisiana, by J. Y. Christmas, Gordon Gunter, and Edward C. Whatley, 12, pp., illus., April 1960.

Sep. No. 598 - Lobster Explorations on Continental Shelf and Slope off Northeast Coast of the United States.

Sep. No. 599 - A Small-Boat Tuna Long-Line Fishery Organization and Management of Fishery Cooperative Associations in the United States, by Leslie D. McMullin, 11 pp., processed, 1959. This paper was presented at the Food and Agriculture Organization Technical Meeting on Fishery Cooperatives, May 12-21, 1959, at Naples.

A Report on the Fish and Wildlife Resources Affected by the Bruce Eddy Dam and Reservoir Project, North Fork Clearwater River, Idaho, 47 pp., illus., processed, June 1960.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-6	Mexico's Fish and Shellfish Canning Industry, 1959.
MNL-7	Mexican Fisheries, 1959.
MNL-8	Portuguese Fishing Industry, 1959.
MNL-23	Fisheries of Chile.
MNL-25	Canadian Reduction Plants.
MNL-26	Taiwan Fisheries in 1959.
MNL-27	French Reduction Plants.
MNL-28	Portuguese Reduction Plants.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fishery Products Monthly Summary, Part I--Fishery Products Production and Market Data, June 1960; 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tuna-like fish; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka Areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for canneries fish; and Mexican frozen shrimp prices for the month indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, July 1960, 11 pp., illus. (Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) The first issue of a new publication which includes monthly sea-surface temperature charts for the eastern Pacific, and fishing and research information of interest to the west coast tuna fishing industry and marine scientists. The temperature charts cover that area of the Pacific from the Aleutians in the north to Peru and Chile in the south and offshore to 180° W. longitude. They show for each month the average sea-surface temperature and the deviations from the 30-year average and from the previous year. Research and fishing information indicates that the distribution of tunas and many other commercial species is directly affected by sea-surface temperatures.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, July 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6 Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, July 1960, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Texas, from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1960, 4 pp. (Market News Service,

U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, June and July 1960, 22 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

Receipts of Fresh and Frozen Fishery Products at New York City's Fulton Fish Market, 1959 (Includes Statistics and Marketing Trends), by T. J. Risoli, 48 pp., processed. (Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York 38, N. Y.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York's wholesale Fulton Fish Market during 1959. The second part covers marketing trends and receipts in the wholesale fresh-water fish market for 1959. The third part consists of a series of statistical tables giving the receipts of finfish and shellfish on the salt-water section of Fulton Fish Market, 1959; receipts by months and methods of transportation; receipts by species, methods of transportation, states and provinces; prices of selected frozen fishery products, 1959, in New York Metropolitan Area; finfish receipts by points of origin and methods of transportation; shellfish receipts by points of origin and methods of transportation; and imports of selected fresh and frozen fishery products, 1959 compared with 1958.

New York City's Wholesale Fishery Trade--Monthly Summary for June 1960, 18 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1960, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D.C.

Distribution and Abundance of Eggs of the Pacific Sardine, 1952-1956, by Elbert H. Ahlstrom, Fishery Bulletin 165 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60, pp. 185-213), 32 pp., illus., printed, 30 cents, 1959.

Education in the Field of Oceanography (Hearing Before the Subcommittee on Earth Sciences of the Committee on Science and Astronautics, U. S. House of Representatives, Eighty-Sixth Congress, First Session, on H. R. 6298), no. 43, 39 pp., printed, August 25, 1959.

Fishery Statistics of the United States, 1958, by E. A. Power, Statistical Digest 49, 424 pp., illus., printed, \$2, 1960. The latest in a series of annual statistical reports on the fisheries of the United States, Alaska, and Hawaii, which contains data on the catch and ex-vessel value of fishery products, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the production and value of manufactured fishery products and byproducts. Special features are data on the relative volume and value of the domestic catch on the United States catch taken on the high seas off foreign coasts. Historical fishery statistics in the report include data on the United States Atlantic cod catch from 1893 to 1958, inclusive. The statistical surveys, conducted during 1959 for 1958 data, covered all sections of the United States. The catch of fishery products in all sections of the United States and Alaska during 1958 totaled approximately 4.7 billion pounds, valued at \$371 million ex-vessel--a decrease of one percent in quantity but an increase of 6 percent in value as compared with 1957.

Menhaden ranked first in quantity among the species taken by United States fishermen, yielding a catch of 1.5 billion pounds--33 percent of the total landings. Although landings of menhaden were up in all areas except New England and Middle Atlantic States as compared with those in 1957, the total production in all areas declined.

Shrimp was again the most valuable single item taken by domestic fishermen, amounting to 214 million pounds, valued at nearly \$73 million ex-vessel. The Gulf of Mexico is the major shrimp-producing area, and accounted for 81 percent of the volume and 88 percent of the value of the total 1958 shrimp catch. The increase in total shrimp landings of 10 million pounds in 1958 as compared with 1957 was due to the development of the fishery for small shrimp off Washington, Oregon, and Alaska.

Several of the major food fish recorded noteworthy increases during the year: salmon (up 42 million pounds); North Pacific halibut (up 3 million pounds); and New England groundfish (up 17 million pounds). The return of sardines to California waters, after a partial absence since 1951, resulted in a catch of 207 million pounds--four-and-a-half times the 1957 production. A decline in the landings of Pacific and jack mackerel, anchovy, sea herring, and oysters were primarily responsible for the 1958 decline in the total landings as compared with the previous year.

The pack of canned fishery products in the United States, Alaska, Hawaii, Puerto Rico, and American Samoa in 1958 amounted to over 1.1 billion pounds valued at nearly \$389 million to the packers. Industrial fishery products amounted to 248 thousand tons of fish meal and scrap, 22 million gallons of fish oils, and 260 million pounds of fish solubles and homogenized condensed fish. Production of fresh and frozen packaged fish fillets and steaks totaled 155.9 million pounds valued at \$51.2 million to the processors. This represented an increase of 1.4 million pounds in volume and nearly \$4.5 million in value over the 1957 production. United States foreign trade in fishery products in 1958 was valued at over \$358 million of which \$327 million represented the value of imports and \$31 million the value of exports. The value of imported fishery products in 1958 was 10 percent greater than in the previous year. Among the more important imports during 1958 were frozen tuna, shrimp, and fresh and frozen groundfish fillets and steaks. The value of exports of domestic fishery products was 14 percent less than in 1957.

The economic data presented in this report are essential for use by persons engaged in the commercial fisheries and by governmental agencies concerned with the regulation, protection, and development of commercial fisheries. Biological information included, which is important to sound fishery management, provides detailed information of fluctuations in the commercial catch by species, locality, gear, and type of craft operated.

Oceanography in the United States (Hearings Before the Special Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-Sixth Congress, First Session), 399 pp., illus., printed, 1959.

Propagation and Distribution of Food Fishes for the Calendar Years 1957-1958, Statistical Digest 46, 48 pp., printed, 20 cents, 1960.

Seasonal Abundance and Vertical Movements of Planktonic Crustaceans in Lake Michigan, by LaRue Wells, Fishery Bulletin 172 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), 31 pp., illus., printed, 25 cents, 1960.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALABAMA:

"Sporadic Mass Shoreward Migrations of Demersal Fish and Crustaceans in Mobile Bay, Alabama," by Harold Loesch, article, *Ecology*, vol. 41, no. 2, April 1960, pp. 292-298, illus., printed. Duke University Press, Box 6697, College Station, Durham, N. C.

ALGAE:

An Annotated List of the Marine Algae of British Columbia and Northern Washington (Including Keys to Genera), by Robert F. Scagel, National Museum of Canada Bulletin No. 150, 289 pp., illus., printed, C\$2.00. Department of Northern Affairs and National Resources, Ottawa, Canada, 1957.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ARGENTINA:

La Merluza del Mar Argentino--Biología y Taxonomía (The Hake of Argentine Waters--Biology and Taxonomy), by Victor Angelescu, Francisco S. Gneri, and Alberto Nani, no. H. 1004, 246 pp., illus., printed in Spanish. Secretaría de Marina, Servicio de Hidrografía Naval, Buenos Aires, Argentina, 1958

AUSTRALIA:

Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography Annual Report, 1958-1959, 24 pp., processed. C. S. I. R. O., Marine Laboratory, P. O. Box 21, Cronulla, New South Wales. An annual report of the Division of Fisheries and Oceanography which is concerned with the study of the aquatic resources of Australia, including whales, the more important fish, crustaceans, and shellfish. Fundamental to this study is an examination of the environment to ascertain the variations in oceanographic conditions which affect biological production and which are to a large extent responsible for fluctuations in fish occurrences.

Fisheries Research Vessel "Derwent Hunter," Report 21, 31 pp., illus., processed. Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography, Marine Biological Laboratory, Sydney, Australia, 1959.

Know Your Fishes (An Illustrated Guide to the Principal Commercial Fishes and Crustaceans of Queensland), by T. C. Marshall, E. M. Grant and N. M. Hayson, Ichthyological Notes, vol. 1, no. 4, 146 pp., illus., printed. Department of Harbours and Marine, Brisbane, Queensland, Australia, May 1959.

BALEARIC ISLANDS:

Carta de Pesca de las Baleares. I--Este y sur de Menorca (Chart of the Balearic Islands' Fishery. I--East and South of Minorca), by Miguel Oliver, no. 28, 1959, illus., printed in Spanish. Instituto Español de Oceanografía, Madrid, Spain.

BOATING:

Recreational Boating Guide, CG-340, 79 pp., illus., printed, 40 cents. U. S. Coast Guard, Washington 25, D. C., June 1, 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Although this handbook is intended primarily for boating enthusiasts, it will also be of interest to those in commercial fisheries as well as related fields. Discusses in some detail the numbering of boats propelled by engines of more than 10 hp; the legal minimum equipment requirements; other desirable equipment; rules for proper operation; aids to navigation; hints on safety afloat; rules for unpowered boats; emergency procedures; and U. S. Coast Guard Auxiliary instructions. The appendixes contain the Federal Boating Act of 1958, the amended Motorboat Act of April 25, 1940, lists of Coast Guard districts; and Government publications of interest to boatmen.

CALIFORNIA:

Statistical Report of Fresh, Canned, Cured, and Manufactured Fishery Products, 1959, Circular No. 34, 18 pp., illus., printed. Department of Fish and Game, Biostatistical Section, Marine Resources Operation, Sacramento, Calif., 1960. This report, the latest in a series of annual reports on commercial fishery

production in California, includes statistical tables on landings by area and by species, tuna imports, fish processing plants, and pack of canned fish. Data are also included on volume of other types of processed fish, canned sardines, sardine meal and oil production, and the annual pack of anchovies, tuna, bonito, and yellowtail.

CAMBODIA:

Etude sur la Peche au Cambodge (Study of the Fisheries of Cambodia), by John E. Bardach, 82 pp., processed in French, June 1959. USOM, Phnom-Penh, Cambodia.

CANADA:

"Cruise No. 20 of the A. T. Cameron," by G. J. Gillespie, article, Trade News, vol. 12, no. 11, May 1960, pp. 3-5, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. Covers a cruise of the Canadian Government fisheries research vessel A. T. Cameron, centered mainly around Western and Emerald Banks lying in the Atlantic southeast of Nova Scotia, to study comparative fishing between the larger vessel and smaller craft, Harengus. Both vessels had been used for survey work on the same populations of groundfish at different times of the year. To be able to compare data obtained by the two vessels, the cruise was designed to test their fishing abilities by having them work side by side on the same populations of fish at the same time.

Economic Survey of Salmon Fishermen in British Columbia, 1953 (Interim Report--Based on Records Obtained from 266 Salmon Fishermen), by Blake A. Campbell and D. R. Buchanan, 57 pp., illus., processed. Department of Fisheries of Canada, Markets and Economic Service, Vancouver, B. C., Canada, January 1955.

The Freshwater Fishes of Canada, by E. P. Slastenko, 387 pp., illus., printed. Klev Printers, 686 Richmond St. W., Toronto, Ontario, Canada, 1958.

The Freshwater Fishes of New Brunswick: A Checklist with Distributional Notes, by W. B. Scott and E. J. Crossman, No. 51, 45 pp., printed. The Royal Ontario Museum, Division of Zoology and Palaeontology, 100 Queen's Park, Toronto, Canada, June 20, 1959.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 3, May 1960, 157 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, these articles: "Salinity Preference, Thyroid Activity and the Seaward Migration of Four Species of Pacific Salmon (Oncorhynchus)" by Bertha Bagerman; "Biochemical Studies on Sockeye Salmon During Spawning Migration, XI--The Free Histidine Content of the Tissues," by J. D. Wood, D. W. Duncan, and M. Jackson; "The Phosphorus-Containing Fractions of Sterile Lingcod Muscle During Storage at 0° C." by Neil Tomlinson, Vera M. Creelman, and K. G. Reid; "A Qualitative and Quantitative Study of the Plankton of the Quoddy Region in 1957 and 1958 with Special Reference to the Food of Herring," by J. E. Henri Legare and Delphine C. MacLellan; and "Isoleine in the Muscle of Pacific Salmon Stored in Ice," by Vera M. Creelman and Neil Tomlinson.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

CANNED FISH:

"Le Conserve di Scombridi con Particolari Riguardi ai tonni" (Canned Scombrid Fishes with Special Reference to Tuna), by A. Piegal, article, Monografia di Tecnologia della Stazione Sperimentale per l'Industria delle Conserve Alimentari, vol. 4, 1958, 141 pp., illus., printed in Italian. Stazione Sperimentale per l'Industria delle Conserve Alimentari, Parma, Italy.

CAPELIN:

On the Migrations and Spawning of the Barents Sea Capelin in 1953 and 1954, by V. S. Prokhorov, 8 pp., processed. (Translated from Trudy Plinro, vol. 10, 1957, pp. 230-243.) Fisheries Laboratory, Lowestoft, England, 1959.

CARP:

Die Karpfenteichwirtschaft in der Deutschen Demokratischen Republik und Ihre Wissenschaftlichen Hauptprobleme (Carp Fish-Pond Farming in the German Democratic Republic and its Principal Scientific Problems), edited by William Schaperclaus, Sitzungsberichte, vol. 7, no. 7, 33 pp., illus., printed in German. Deutsche Akademie, Landwirtschaftswissenschaften, Berlin, Germany, 1958.

CEYLON:

Fischer auf Ceylon--Ein Beitrag zur Wirtschafts- und Bevölkerungs-Geographie des Indischen Subkontinents (Fisheries of Ceylon--A Study of the Economics and Community-Life of the Indian Subcontinent), by Fritz Bartz, vol. 27, 121 pp., illus., printed in German. Bonner Geographische Abhandlungen, Institut der Universität Bonn, Bonn, Germany, 1959.

COD:

"Aspectos de Industria Nacional do Bacalhau" (Outlook of the National Cod Industry), by A. Torres Botelho, article, Conservas de Peixe, vol. 15, no. 168, April 1960, pp. 47-48, illus., printed in Portuguese. Conservas de Peixe, Sociedade Astoria, Lda., Requeirao dos Anjos, 68, Lisbon, Portugal.

COLD STORAGE:

"Typical Designs of Cold Stores for Fish," by L. M. Kazanskiy, article, Rybnoe Khoziaistvo, no. 7, July 1959, pp. 65-72, illus., printed in Russian. Rybnoe Khoziaistvo, Kotel 'nicheskaya Naberezhnaya D 1/15, Souzpechat Otdel "Zhurnal-Pochtol," Moscow Zh 240, U. S. S. R.

DEMERSAL FISH:

Rapports et Proces-Verbaux des Reunions (Contributions to Special Scientific Meeting on Measures for Improving the Stock of Demersal Fish in the Baltic), vol. 147, 96 pp., illus., printed, Kr. 20 (US\$2.90). Conseil Permanent International pour l'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, August 1959.

FISH COOKERY:

The Art of Fish Cookery, by Milo Miloradovich, 471 pp., illus., printed. Doubleday & Company, Inc. Garden City, N. Y., 1949.

FISH PONDS:

How To Look After a Fishpond, by L. Davambez, 31 pp., printed, A. Is. Od. (11 U. S. cents). South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

FISHWAYS:

The Size and Location of Escape Ports for Bypassing Salmonid Fish at a Screened Diversion Canal (Thesis of Harry Henry Wagner for the Master of Science Degree in Fisheries), 85 pp., illus., processed. Oregon State College, Corvallis, Oreg., April 1959.

FLORIDA:

Apalachicola Watershed, Fish Management Bulletin No. 4, 15 pp., illus., printed. Florida Game and Fresh Water Fish Commission, Fisheries Division, Tallahassee, Fla., July 1959.

FROZEN FISH:

"Frozen Fish in Cabinets Has Limited Storage Life," article, Frozen Foods, vol. 12, no. 6, June 1959, p. 386, printed. Frozen Foods, Refrigeration House, Victoria Rd., Woking, England.

FUR SEALS:

"Blood Types in Fur Seals," by Kazuo Fujino and John E. Cushing, article, Science, vol. 131, no. 3409, April 29, 1960, p. 1310, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW, Washington 5, D. C.

GEAR:

"En Ny Synthetisk Fiber til Fiskeredschap" (Courlene--A New Synthetic Fiber for Fishing Gear), article, Fangst og Fiske, vol. 11, no. 1, 1959, printed in Norwegian. Fangst og Fiske, Landaslien 19, Bergen, Norway.

How to Look After Fishnets, by L. Devambez, 15 pp., printed, A. Is. Od. (11 U. S. cents). South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

Net Repair Manual, by Stacy V. Gebhardts, 23 pp., illus., processed. Department of Fish and Game, Boise, Idaho, 1960. Although most fishing nets today are machine tied and are purchased ready-made from various firms, net repairs must still be done by hand. The purpose of this manual is merely to acquaint the beginner with the proper procedure in net mending. Proficiency in mending, according to the author, can come only through practice. The techniques described are essentially those which are used by commercial fishermen in the Illinois River Valley with some modifications by the author.

GENERAL:

"The Buoyancy of Marine Animals," by Eric Denton, article, Scientific American, vol. 203, no. 1, July 1960, pp. 118-128, illus., printed. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. Most fishes are equipped with swim bladders which give them neutral buoyancy and save them the effort of continuous swimming. The cuttlefish and the cranchid squid have developed quite different kinds of flotation organs. They anticipated man in using the working principles of the submarine and the bathyscaphe, the one endowing the cuttlefish with active control of its buoyancy, the other permitting the squid to live at great depths.

Journal du Conseil, vol. 25, no. 2, March 1960, 124 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlotten-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

lund Slot, Denmark. Includes, among others, these articles: "Upper Lethal Temperatures for Larval Salmonids," by H. M. Bishai; "The Effect of Water Currents on the Survival and Distribution of Fish Larvae," by H. M. Bishai; "Food Habits of Larval Cod, Haddock, and Coalfish in the Gulf of Maine and Georges Bank Area," by Robert R. Marak; "New Implements for Fish Tagging," by Arni Friðriksson, Olav Aasen and Arne Revheim; "Mesh Selection and Apparent Growth of Haddock," by Rodney Jones; "A Note on the Dependence of Catches on Temperature and Wind in the Buchan Pre-Spawning Herring Fishery," by R. E. Craig; "Some Observations on the Body Proportions of North Sea Autumn Spawning Herring," by R. Muzinic and B. B. Parrish (with an appendix by J. A. Pope); and "Observations on the Size and Numbers of Herring Taken by the Herring Trawl," by I. D. Richardson.

Turn to the Sea, by Athelstan Spilhaus, 50 pp., illus., printed. National Academy of Sciences, National Research Council, Washington D. C., 1959.

GENERAL AGREEMENT ON TARIFFS AND TRADE: Negotiations Under the Trade Agreements Act of 1934 as Amended and Extended (List of Products on which the U. S. May Seek Concessions from Other Countries; Notice of Public Hearings), Department of State Publication 6987, 69 pp., processed, 30 cents. The Interdepartmental Trade Agreements Organization, Washington, D. C., May 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Fish and fishery products are included among the products listed.

Negotiations Under the Trade Agreements Act of 1934 as Amended and Extended (Notice of U. S. Intention to Negotiate; List of Products to be Considered for Possible U. S. Concessions; Notice of Public Hearings), Department of State Publication 6986, 118 pp., processed, 40 cents. Interdepartmental Trade Agreements Organization, Washington, D. C., May 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Fish and fishery products are among the products listed.

HAWAII:

Handbook of Hawaiian Fishes, by William A. Gosline and Vernon E. Brock, 381 pp., illus., printed, \$11.00. University of Hawaii Press, Honolulu 14, Hawaii, 1960. This is the first handbook for the identification of fishes of the Hawaiian Islands known to the reviewer since Jordan and Gilbert's two-volume study published in 1905, now out of print. The authors have simplified as much as possible the process of determining correctly the species of Hawaiian fishes. The nontechnical person as well as the trained ichthyologist will find much of interest in this book. The secondary purpose of the handbook--to provide definitive common names for the more important commercial fishes in order to achieve uniformity of names for catch statistics and law enforcement--will be of interest to commercial fisheries interests. The preferred common name is identified easily since it is placed immediately under the scientific name. But less desirable common names are also given. Every native inshore fish that has been validly recorded from Hawaiian waters is included.

Intentionally-introduced fresh-water and marine species are also described although the section on the latter is a short one. Except for scientific names, scientific terms have been generally avoided. Illustrations consist of 279 figures which are aids to identification. Also included are five beautiful color plates which portray the beauty of Hawaiian fishes. Keys are provided for all Hawaiian fish families and for all inshore species. The authors point out in their preface that the book is the result of widespread cooperation and credits are widely subdivided. Among the chapters in the book are the following: Ecology of Hawaiian Fishes; the Nature and Derivation of Hawaiian Fishes and Keys to Families; and Accounts of Families and Species of Hawaiian Fishes. There are two appendices: Intentionally Introduced Marine Species; and Check List of Native Hawaiian Fishes. The book is indexed.

--Joseph Pileggi

HERRING:

Scale Character and Growth Rate (A Study on Small Fat Herring from North Norway), by Mahhargo Soeprapto, vol. 12, no. 5, 16 pp., illus., printed. A. S. John Griegs Boktrykkeri, Bergen, Norway, 1958.

Vintersild (Winter Herring Fishery), by Magne Flem and Bjarne Skarbovik, 36 pp., illus., printed in Norwegian and English. Sunnmorsposten, Aalesund, Norway, 1959. An unusual booklet of photographs depicting many aspects of the winter herring fishery and the hardy fishermen who work it. The text accompanying the photos describes the preparations for the season in early January, the location of the fishing grounds just outside the coastal fringe of islands, the purse-seiners and drifters which catch the herring, locating the herring, methods of catching, the fishing villages, and plants for processing the herring.

INDIA:

"Observations on the Trawl Fisheries of the Bombay and Saurashtra Waters, 1949/50 to 1954/55," by R. Jayaraman and others, article, *Indian Journal of Fisheries*, vol. 6, no. 1, April 1959, pp. 58-144, illus., printed. Ministry of Food and Agriculture, Government of India, New Delhi, India.

JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, no. 3, November 1959, 112 pp., illus., printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following articles: "Studies on Air Screen in Water. 1--Preliminary Observation of Behavior of Fish School in Relation to an Air Screen," by Kiichiro Kobayashi and others; "Chemical Studies on Marine Algae. XIII--Isolation of Crystal L-Citrulline from *Chondrus ocellatus* and *Rhodoglossum pulchrum*," by Mitsuo Kuriyama, Mitsuo Takagi, and Kiichi Murata; "Quality of Flatfish from Hakodate. Part 2--The Factors Deciding the Quality. 3--Relations Between the Quality and the Amount of Connective Tissue. 4--Relations Between the Quality and the Amount of Acid Soluble Phosphorus. 5--Relations Between the Quality and the Extractive Nitrogen," by Keiichi Oishi; and "The Territorial Waters in the U. S. S. R.," by Akira Suzuki.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, no. 4, February 1960, 90 pp., illus.,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Includes, among others, the following articles: "Quality of Flatfish from Hakodate. Part 3--The Factors Deciding the Quality. 6--Relations Between the Quality and the Amino Acid Composition of the Muscle Extractives," by Keiichi Oishi; "Observations on the Ship's Drifting due to Wind Action," by Shoji Saito, and "Studies on the Heat Sterilization of Fish Sauage," by Eiichi Tanikawa and others.

On the Fishes of the Family Chlorophthalmidae, by Toshiji Kamohara. Research Report of the Kochi University, vol. 5, no. 15, 17 pp., illus., printed in Japanese with English summary. The Kochi University, Kochi, Japan, 1959.

Illustration of Japanese Fishing Boat and Fishing Gear, 228 pp., illus., printed in Japanese and English, \$6.00. Japan Association for Agriculture and Forestry, Norin-sho Bldg., 2 Chome Kasumigaseki, Chiyodaku, Tokyo, Japan, 1959.

Memoirs of the Faculty of Fisheries of Kagoshima University, vol. 8, February 1960, 193 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Contains, among others, the following articles: "Studies on the Life Histories of the Flying-Fishes Found in the Adjacent Waters of Japan-II," by Sadahiko Imai; "Carbonyl Compounds in Fish as Related to the Deterioration, III--Factors Affecting the Formation of Volatile Carbonyl Compounds in Fish Flesh," by Fuyuo Ota; "On the Process of the Formation of Lower Carbonyl Compounds in the Enzymatic Oxidation of Linoleic Acid," by Fuyuo Ota; "On the Storage of Frozen Whole-Round Skipjack, I--The Denaturation of Skipjack Muscle Protein Under the Freezing and Cold Storage," by Jun-ichi Nishimoto and Kazuo Tanaka; and II--"Histological Study of the Frozen Skipjack Muscle Tissue," by Jun-ichi Nishimoto and Kazuo Tanaka; "Studies on the Biochemical Change in Fish Muscle, XI--On the Enzymic Degradation of ATP by Unpurified Actomyosin Fraction of Fish Muscle," by Tomio Hidaka and Kaname Saito; "Biophysical Studies on the Auditory Characteristic of Fish, II--Directional Audibilities in Various Types of Lateral Line," by Toshiro Kuroki; "Simplified Ultrasonic Shell-Plate-Flaw-Detector for Fishing Vessel with the Use of the Standing-Wave Technique in the Thickness-Measurement," by Yoshikazu Narasaki, Sukehiro Oya and Akira Yamabe; "Studies on the Constitutional State of Skipjack Fishing Ground over the Waters near the Tokara Retto, I--On the Relation between the Water Temperature and the Catching Condition in the Fishing Ground," by Tomokazu Morita; "A Consideration on the East China Sea Region Mackerel Fisheries," by Sumio Enami; "Studies on Bubble Net, I--Driving and Intercepting Effect on Some Fresh-Water Fishes," by Sumio Enami; "On the Physical Analysis of the Fixed-Fishing-Net Resistance," by Masaji Kanamori; and "Studies on the Radiological Contamination of Sea Water, Planktons and Fishes in the Western Region of the North Equatorial Current during the Period from 1958 to 1959" by Kaname Saito, Munao Sameshima, and Tomio Hemmi.

Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 7, no. 1/2, 155 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan, 1959. Includes, among others,

following articles: "The Marine Algae of Southern Saghalien," by J. Tokida; "Studies on the Proteins of the Meat of Sea Cucumber (*Stichopus japonicus* Selenka)," by E. Tanikawa; "Studies on the Manufacture of Algin from Brown Algae," by N. Suzuki; "Studies on the Tropomyosin of Squid," by K. Yoshimura; "Studies on Fishing Ground, Fishing Gears, and Fishing Technique in One-Boat Medium Trawl Fisher," by I. Saito; "Physico-Chemical Studies on the Activation and Fertilization of Fish Eggs," by S. Hamono; "The Species of Gracilaria and Gracilaropsis from Japan and Adjacent Water," by H. Ohmi; "Studies on the Technical Problems in the Processing of Canned Salmon," by E. Tanikawa; and "Studies on Technical Problems in the Processing of Canned Crab," by E. Tanikawa.

LAW OF THE SEA:

La Plataforma Continental y los Problemas Jurídicos del Mar (The Continental Shelf and the Juridical Problems of the Sea), by Humberto Lopez Villamil, 69 pp., printed in Spanish. Talleres Graficos, Juan Bravo, 3, Madrid, Spain, 1958.

The United States and the Treaty Law of the Sea, by Henry Reiff, 451 pp., printed. University of Minnesota Press, Minneapolis 14, Minn., 1959.

LAW OF THE SEA CONFERENCE:

La Conferencia de Ginebra y la Anchura del Mar Territorial (The Geneva Conference and the Extent of the Territorial Sea), by Alfonso Garcia Robles, 410 pp., printed in Spanish. Libreria de Porrúa Hermanos y Cia., S. A., Mexico D. F., Mexico.

LOBSTER:

"Many Types of Lobster Pots Used in Wales," article, World Fishing, vol. 8, no. 3, March 1959, pp. 41-43, illus., printed. World Fishing, John Trundell (Publishers), Ltd., Temple Chambers, Temple Ave., London EC4, England.

"World's First Quick-Freeze Lobster Boat," article, Trade News, vol. 12, no. 11, May 1960, p. 17, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. The Francoise Christine is the first quick-freeze lobster fishing vessel in the world which carries out vacuum-packing of lobster meat on board ship. The canning and packing process under vacuum is discussed.

MACKEREL:

"El Pejerrey" (The Mackerel), by F. Lahille, article, Boletín del Ministerio de Agricultura de la Nación, vol. 28, no. 3, July-September 1929, pp. 261-395, illus., printed in Spanish. Biblioteca del Ministerio de Agricultura, Paseo Colon 974, Buenos Aires, Argentina.

MISCELLANEOUS:

Substances Responsible for Taste and Smell in Fish, by F. Bramstedt, Translation Series No. 235, 15 pp., processed. (Translated from Archiv für Fischereiwissenschaft, vol. 8, pp. 94-103.) Fisheries Research Board of Canada, Technological Station, Grande Rivière, Quebec, Canada, 1959.

NIGERIA:

Annual Report, Fisheries Division, Ministry of Agriculture, 1958-59. Official Document No. 15 of 1960,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

8 pp., printed, 1s (about 14 U. S. cents). Government Printer, Eastern Region, Enugu, Nigeria. Discusses the activities and accomplishments of the Fisheries Division of the Eastern Region of Nigeria during 1958-59. Contains sections on the organization; fisheries development plan, 1958-62; colonial development and welfare fisheries scheme; fisheries extension experimental fishing and investigations, and fresh-water fisheries.

NORWAY:

"Fettinnehold i Vintersild 1960" (Fat Content of Winter Herring in 1960), by Fredrik Vilmark, article, *Fiskets Gang*, vol. 46, no. 19, May 12, 1960, pp. 275-276, illus., printed in Norwegian. *Fiskets Gang*, Postgiro Nr. 691 81, Bergen, Norway.

"La Industria Noruega de Conservas de Pescado en el Año Ultimo" (The Norwegian Fish Canning Industry in 1959), article, *Industria Conservera*, vol. 26, no. 249, March 1960, pp. 67-68, printed in Spanish. *Industria Conservera*, Calle Marques de Valladares, 41, Vigo, Spain.

"Rapport om Fiskeforsok med Bankliner pa Rostbanken med M/K Vitamin av Tromso Februar/Mars 1960" (Report on Line Fishing at Rostbanen by the Research Vessel Vitamin out of Tromso Feb./Mar. 1960), by Kaare Halmo, article, *Fiskets Gang*, vol. 46, no. 23, June 1960, pp. 354-357, illus., printed in Norwegian. *Fiskets Gang*, Postgiro Nr. 691 81, Bergen, Norway.

OCEAN PERCH:

The Fisheries of the Redfish in the Southern Part of the Barents Sea and in the Kopytov Area, by V. I. Travlin, 13 pp., processed. (Translated from Trudy Pinro, vol. 10, 1957, pp. 161-171.) *Fisheries Laboratory, Lowestoft, England, 1959.*

Sex and Age Composition of the Beaked Redfish (SE-BASTES MENTELLA Travlin) of the Kopytov Area, by YE. I. Surkova, 15 pp., processed. (Translated from Trudy Pinro, vol. 10, 1957, pp. 172-185.) *Fisheries Laboratory, Lowestoft, England, 1959.*

OCEANOGRAPHY:

Data Report for Two IGY Cruises, by Hugh J. McLellan, A. & M. Projects 137 & 24, Reference 50-15D, 117 pp., illus., processed. The Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, April 1959.

Investigations of Climate and Oceanographic Factors Influencing the Environment of Fish (Covering Period July 1, 1959-September 30, 1959), by Dean F. Bumpus, Reference No. 50-49, 9 pp., illus., printed. Woods Hole Oceanographic Institution, Woods Hole, Mass., October 1959.

A Method for Measuring Eddy Diffusion in Coastal Embayments, by Frank W. Moon, Jr., Charles L. Bretschneider and Donald W. Hood, Series No. 84, 13 pp., illus., printed. (Reprinted from *Institute of Marine Science*, vol. 4, no. 2, July 1957). Department of Oceanography of the Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, November 1957.

Net Weekly Variation of Vertical Temperature Structure in the Upper Ocean Layers (Autumn, North Atlantic), by Robert A. Gilcrest, A. & M. Project 24, Reference 57-2T, 77 pp., illus., processed. The Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, January 1957.

Oceanography and Meteorology of the Gulf of Mexico (Annual Report, May 1, 1958-April 30, 1959), by Hugh J. McLellan, A & M Project 24, Reference 50-16A, 42 pp., processed. Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Tex., 1959.

Résumés Scientifiques des Campagnes de la CALYPSO (Scientific Results of Calypso Cruises), Annales de l'Institut Océanographique (Records of the Oceanographic Institute), vol. 37, 342 pp., illus., printed in French. L'Institut Océanographique, 120 Blvd. Saint-Germain, Paris, France, 1959. Covers the "Campagne 1956 dans le Golfe de Guinée et aux îles Principe, São Tomé et Annobon" (The 1956 Cruise in the Gulf of Guinea and on the Principal Islands of São Thome and Annobon); "Campagne 1956 sur les Côtes de Provence" (The 1956 Cruise off the Coasts of Provence); "Campagne 1957 dans le Golfe de Gênes (The 1957 Cruise in the Gulf of Genoa); and "Campagne 1958 en Mer d'Alboran et dans la Baie Ibero-Marocaine" (1958 Cruise in the Sea of Alboran and in the Spanish Moroccan Bay).

OYSTERS:

"Oyster Farming," by George W. Allen, article, *Alabama Conservation*, vol. 31, no. 6, April-May 1960, pp. 4-6, illus., printed. Alabama Dept. of Conservation, 711 High St., Montgomery, Ala. Discusses various aspects of oyster farming--selection and preparation of oyster beds, method of sowing spat, predators and diseases of oysters, and outlook for the oyster industry.

"Oysters Year 'Round," article, *Louisiana Conservationist*, vol. 12, nos. 5-6, May-June 1960, pp. 10-11, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life & Fisheries Bldg., 400 Royal St., New Orleans, La. Describes, in semi-humorous style, the culinary and nutritional attributes of the oyster and presents a number of recipes for preparing this gourmet's favorite.

Quality Determination of Mussels (MYTILUS EDULIS) and Oysters, by P. Korringa, Translation Series No. 76, 6 pp., illus., processed (Translated from *Archiv für Fischereiwissenschaft*, vol. 6, no. 3/4, 1955, pp. 189-193.) *Fisheries Research Board of Canada, Ottawa, Canada, 1956.*

"Serological Studies on Relationships Among Oysters of Different Genus, Species, and Races," by Kenichi Numachi, article, *The Tohoku Journal of Agricultural Research*, vol. 10, no. 3, November 1959, pp. 313-319, illus., printed. The Faculty of Agriculture, Tohoku University, Sendai, Japan.

PEARL OYSTERS:

Survey of the Pearl Banks, Gulf of Mannar, 1955, by S. Sivalingam, Contribution No. 2, 19 pp., illus., pp. 308-325.) *Fisheries Research Station, Colombo, Ceylon*. Covers a survey of the Gulf of Mannar in

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

1955 to ascertain the presence of pearl oysters, location, and extent of oyster beds. The survey also determined the age composition of oysters, size of population, and value of the oysters collected. This report is based on the results of dredging operations only.

PHILIPPINES:

Observations on Philippine Fisheries, by Ole J. Heggen, 27 pp., processed. International Cooperation Administration, U. S. Operations to the Philippines, Manila, Philippines.

PRESERVATION:

Fish Preservation Simplified, by H. van Pel, 22 pp., illus., printed. South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

RAINBOW TROUT:

Delayed Mortality of Hatchery-Reared Rainbow Trout in Relation to Five Chemical Factors Encountered in Transporting Waters (Thesis of DeVon Wayne Linn for the M. S. Degree in Fisheries), 88 pp., illus., processed. Oregon State College, Corvallis, Oreg., June 1955.

REFRIGERATION:

Die Anwendung der Kalte in der Lebensmittelindustrie. Handbuch der Kalteotechnik (Application of Refrigeration in the Food Industry. Handbook of Refrigeration), 690 pp., illus., printed in German, D. M. 114 (about US\$27.14). Springer Verlag, Heidelberger Platz 3, Berlin, Germany, 1960. Includes a chapter on fish--physical properties, keeping fish fresh above their freezing point, sanitary requirements for ice, complementary losses, freezing, and freezing of fish and crustacea on board ship.

RHODESIA:

Proceedings of the First Fisheries Day in Southern Rhodesia (Salisbury, August 1957), 88 pp., illus., printed. Federal Ministry of Agriculture, Salisbury, Rhodesia, 1959.

SALMON:

Behavior of Chinook and Silver Salmon, by George H. Allen, Contribution No. 24, 6 pp., illus., printed. (Reprinted from Ecology, vol. 40, no. 1, January 1959, pp. 108-113.) University of Washington, School of Fisheries, Seattle, Wash.

Biochemical Analysis of Young Salmon at the Time of Their Transformation to a Condition Close to the Smolt Stage, and During Retention of Smolts in Fresh Water, by E. M. Malikova, Translation Series No. 232, 19 pp., processed. (Translated from Trudy Latvisskovo Otdeleniya VNIRO, vol. 2, 1957, pp. 241-255.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada.

An Examination of Factors Affecting the Abundance of Pink Salmon in the Fraser River, by E. H. Vernon, 52 pp., illus., processed. International Pacific Salmon Fisheries Commission, New Westminster, British Columbia, Canada, 1958.

Transformation to Smolt Stage and Downstream Migration of Young Salmon, by N. V. Evropeitseva, Translation Series No. 234, 36 pp., processed. (Translated from Uchenye Zapiski Leningradskovo

Gosudarstvennovo Universiteta (LGU), No. 228, Seriya Biologicheskikh Nauk No. 44, 1957, pp. 117-154.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada, 1959.

SARDINES:

"La Fabricacion de Conservas de Sardina con Pescado Congelado" (The Manufacture of Canned Sardines with Frozen Fish), article, Industria Conservera, vol. 26, no. 249, March 1960, pp. 70-72, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

SCOTLAND:

"Results of Scottish Herring Fisheries in 1959 and Prospects for 1960," by B. B. Parrish and I. G. Baxter, article, Scottish Fisheries Bulletin, no. 13, June 1960, pp. 2-10, illus., printed. The Marine Laboratory, Department of Agriculture and Fisheries for Scotland, Victoria Road, Torry, Aberdeen, Scotland.

SEALS:

"Selfangsten 1959" (Seal Catch in 1959), by Sverre Mollestad, article, Fiskets Gang, vol. 46, no. 18, May 1960, pp. 261-266, printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

SHELLS:

"Shell Take and Prices Down," article, Fisheries Newsletter, vol. 19, no. 5, May 1960, pp. 13, 27, printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia. The decline in production and consequent drop in pearlshell prices during the past two years was due to the development of cheaper plastic button, competitive with the shell buttons, and also to unfavorable weather. The Australian government and the industry have attempted to promote the use of pearl shells by means of a joint sales campaign.

SHRIMP:

Aspects of the Biology of the Tortugas Pink Shrimp, PENAEUS DUORARUM, by Edwin S. Iverson and C. P. Idyll, Contribution No. 246, 8 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 1, 1960.) The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla. On the Tortugas grounds, off southern Florida, biologists tagged shrimp with Petersen disc tags. A general tendency was noted for adult shrimp to move in a northwesterly direction. Females attain larger sizes than males and growth of the carapace, which is more easily measured than total length, is related linearly to total length. Size-frequency distributions suggest that small shrimp move from shallow water at the end of the Florida peninsula to the Tortugas grounds. Some salinity and temperature data are given.

"Shrimps: the U. S. Industry," by W. Adair Stewart, article, Foreign Trade, vol. 114, no. 2, July 16, 1960, pp. 15-16, printed. Queen's Printer, Government Printing Bureau, Ottawa, Canada. The author describes the commercial importance of the frozen shrimp industry in the United States, management and conservation of the shrimp fishery, the search for new fishing grounds, and potential sources of foreign supplies.

SPAIN:

"La Produccion Conservera Espanola en 1958" (Spanish Canning Production in 1958), article, Boletin de

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Informacion del Sindicato Nacional de la Pesca, no. 19, April 1960, pp. 10-11, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

SPINY LOBSTERS:

Lobster Fishing in Ceylon, by G. H. P. DeBruin, Bulletin No. 9, 19 pp., illus., printed. The Fisheries Research Station, Department of Fisheries, Colombo, Ceylon, 1960. Spiny lobsters are present in Ceylon waters, according to the author, but an established fishery does not exist due partly to the absence of efficient methods of capture. Gear efficiency tests were therefore conducted using lobster traps such as the Scottish creel, Canadian "parlour and bedroom," and the Cornish "ink-well" in order to find an efficient method of capturing lobsters. The Canadian "parlour and bed-room" type constructed of steel and hemp netting proved to be the most effective trap. Diving operations revealed the existence of spiny lobsters on both the east and west coasts of Ceylon but for some unknown reason traps were ineffective on the east coast. On the west coast, however, experiments with traps showed the presence of lobsters in commercial quantities in rocky areas and coral reefs.

Production and Distribution of Larvae of the Spiny Lobster, *PANULIRUS INTERRUPATUS* (Randall) with Records on P. *GRACILIS* Streets, by Martin W. Johnson, 52 pp., illus., printed, \$1. (Reprinted from Bulletin of the Scripps Institution of Oceanography, vol. 7, no. 6, May 23, 1960, pp. 413-462.) University of California Press, Berkeley, Calif., 1960. A study of the occurrence and distribution of the phyllosoma larvae of the spiny lobster. In this investigation the material consisted of phyllosoma larvae of *Panulirus interruptus* (and to a lesser extent of *P. gracilis*) sorted from a large number of plankton hauls taken with a 1-meter net, mainly along the coast of California and Baja California, by several vessels during all seasons over a period of seven years. Findings showed that: the height of the hatching season is August and September; only one brood is produced each year by the spawning female; the complete phyllosoma larval period is about 7-3/4 months; and recruitment of lobsters on the coast of California and Baja California must depend upon the development of large eddies, swirls, and counter-currents which retard the flushing out of larvae to the south with the California current.

STEELHEAD TROUT:

Factors Influencing the Seaward Migration of Smolt Steelhead Trout, *SALMO GAIRDNERII GAIRDNERII* Richardson, in the Alsea River, Oregon (Thesis of Rupert Earle Andrews for the M. S. Degree in Fish and Game Management), 99 pp., illus., processed. Oregon State College, Corvallis, Oreg., October 1958.

TILAPIA:

"Tilapia," by William R. Heard, article, Alabama Conservation, vol. 31, no. 5, February-March 1960, pp. 7-8, 23-24, illus., printed. Alabama Department of Conservation, Union St. Administration Bldg., Montgomery, Ala. During the past two years, *Tilapia nilotica* or *T. mossambica* have been added to 11 of Alabama's state-owned and managed lakes in an attempt to evaluate their usefulness in supplement-

ing bream and bass fishing, and to determine their effectiveness in controlling obnoxious algae, *Pithophora*. To date, good catches of *Tilapia* have been taken from these lakes, although its effectiveness in controlling the algae is still in doubt.

TRANSPORTATION:

Fish Packing Boxes for Sea Transportation, by S. R. Suntur, 5 pp., illus., printed. (Reprinted from General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, Technical Paper 64, no. 5, pp. 459-463.) General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Rome, Italy, 1959.

TRAWL FISHING:

Forecasting the Stock Available and the Conditions for Trawl Fishing, by N. A. Maslov, Translation Series No. 220, 24 pp., processed. (Translated from Trudy Piliarovno N.-I. Institut Morskovo Rybnovo Khodatastva i Okeanografii (PINRO), no. 10, 1957, pp. 5-29.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada, 1959.

TRAWLERS:

Resistance and Propulsion of Trawlers, by D. J. Doust and T. P. O'Brien (paper read at the North East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-upon-Tyne 1, England, April 3, 1959, 82 pp., printed), from Journal of the British Shipbuilding Research Association, 5 Chesterfield Gardens, Curzon St., London W1, England, 1959.

TRAWLING:

"Midwater Trawling," article, Trade News, vol. 12, no. 11, May 1960, pp. 9-12, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. Midwater trawling is a fishing method which is attracting widespread interest at the present time. Basically it is an old method that was not particularly satisfactory until new electronic devices were added after World War II. Over the past decade and especially within the past three years, improvements have been superimposed one upon another with remarkable rapidity both in northern Europe and in North America. Because scientists and technologists have shared their findings, representing one continuous development, and especially as one of the most important steps was taken in Canada and interesting practical experiments are still under way, it is proposed to outline these advances, beginning with this summary of early developments outside of Canada. This article, the first of a series of articles on developments in mid-water trawling, discusses the development of the Larsen two-boat trawl, designed primarily for the Danish herring fishery; the French "Exocet" trawl device; Finland's pair-trawling; the Phantom trawl designed by a Swedish naval architect; and the German trawl with four otter boards. It also discusses the modification of these methods of midwater trawling by other countries to fit their own particular needs.

TRAWLS:

"An Improved Design for Small Trawl Doors," by W. A. King-Webster, article, World Fishing, vol. 8, no. 1, January 1959, pp. 40-42, printed. World Fishing, John Trundel (Publishers) Ltd., Temple Chambers, Temple Ave., London EC4, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Das Schwimm-Schleppnetz (The Floating Trawl)," by A. von Brandt, article, Die Bundesanstalt für Fischerei, vol. 5, nos. 22/23, October 1958, pp. 201-226, illus., printed in German. Die Bundesanstalt für Fischerei, Neuer Wall 72, Hamburg 36, Germany.

TUNA:

"Trolling and Longlining for Tuna," by Louis Devambez, article, South Pacific Bulletin, vol. 10, no. 2, April 1960, pp. 32-33, illus., printed, 30 U. S. cents. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. The French Institute of Oceania has published two illustrated booklets recording the results of experimental tuna fishing carried out by its fisheries research vessel Orsom III, over a period of several years. Two techniques for commercial use, trolling and longlining, were finally selected, and each is the subject of a separate report. Both are reviewed in the present article.

"Vers une Adaptation des Méthodes de Prises aux Habitudes du Thon" (Towards an Adaptation of Catching Methods to the Habits of the Tuna), article, France Peche, vol. 5, no. 41, June 1960, pp. 21-22, illus., printed in French. France Peche, Tour Sud-Est, Rue de Guemene, Lorient, France.

UNITED STATES GOVERNMENT:

United States Government Organization Manual, 1960-61, 822 pp., illus., printed, \$1.50. Office of the Federal Register, National Archives and Records Service, Washington 25, D. C., June 1, 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The official organization handbook of the Federal Government. Contains sections descriptive of the agencies in the legislative, judicial, and executive branches. Supplemental information includes brief descriptions of quasi-official agencies and selected international organizations, charts of the more complex agencies, and appendices relating to abolished or transferred agencies, to governmental publications, and to certain ancillary material. Also describes the agencies connected with fisheries: U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Defense

Fisheries Administration, Fisheries Division of FAO, and Bureau of Sport Fisheries and Wildlife.

VENEZUELA:

Actividades Pesqueras en Venezuela en el Año 1957--Observaciones Generales de los Problemas Pesqueros Nacionales (Venezuelan Fishing Activities in 1957--General Observations of National Fishery Problems), 102 pp., illus., processed in Spanish. Ministerio de Agricultura y Cria, Dirección de Recursos Naturales Renovables, División de Pesca y Caza, Caracas, Venezuela, May 1959.

VESSELS:

"Are 'Container' Fishing Vessels Practical?" by G. W. Lehmann, article, World Fishing, vol. 8, no. 4, April 1959, pp. 94-95, illus., printed. World Fishing, John Trundell (Publishers) Ltd., Temple Chambers, Temple Ave., London EC4, England. In a container fishing vessel, the movable containers are placed in the fish hold in such a way that they are filled on the fishing grounds with processed fish, and upon arrival at the home port they are immediately unloaded and distributed inland by truck or railroad car. As the containers remain open during the fishing period, a service alley between them must be provided and so arranged that the doors of the containers may be opened and closed leaving sufficient accessibility for loading. Such service alleys need hatches above them, located preferably forward. Containers are built with watertight openings in order to provide watertight buoyancy bodies within the space as a reserve buoyancy when a vessel is stricken in heavy weather. The fish space of a container fishing vessel need not be insulated since the containers themselves are. Each is equipped with a refrigerating unit, which is fed by the ship while at sea and connected to the truck on shore.

WALRUS:

Preliminary Investigation of the Atlantic Walrus, ODONOBENUS ROSMARUS ROSMARUS (Linnaeus), by Alan G. Loughrey, Wildlife Management Bulletin, series 1, no. 14, 127 pp., illus., processed. Department of Northern Affairs and National Resources, National Parks Branch, Canadian Wildlife Service, Ottawa, Canada, 1959.



CONTENTS (CONTINUED)

Page	FEDERAL ACTIONS (Contd.):	Page	FEDERAL ACTIONS (Contd.):
	Department of the Interior:		Department of State:
	Fish and Wildlife Service:		International Cooperation Administration:
91 . .	Federal Code of Regulations for Fish and Wildlife Revised	98 . .	Fisheries Grants to Foreign Countries
92 . .	United States Whaling Regulations Brought Up to Date	Treasury Department:	
	Bureau of Commercial Fisheries:	98 . .	Coast Guard:
92 . .	Quality Standards Established for Frozen Shrimp	98 . .	Fishing Vessels Exempted from Advance Arrival Time Notice
95 . .	Prohibition Extended on High-Seas Net Fishing for Salmon in North Pacific	98 . .	Eighty-Sixth Congress (Second Session)
96 . .	United States Aid in Fishing Vessel Construction not Included Under Mortgage Insurance Plan	101 . .	FISHERY INDICATORS:
96 . .	Bureau of Indian Affairs:	101 . .	Chart 1 - Fishery Landings for Selected States
	Commercial Fishing Regulations for Red Lake Indian Reservation Revised	102 . .	Chart 2 - Landings for Selected Fisheries
	Department of Labor:	103 . .	Chart 3 - Cold-Storage Holdings and Freezings of Fishery Products
	Wage and Hour Division:	104 . .	Chart 4 - Receipts and Cold-Storage Holdings of Fishery Products at Principal Distribution Centers
97 . .	Industry Committee to Review Wage Rates in Puerto Rico for Fish Canning Industry	104 . .	Chart 5 - Fish Meal and Oil Production--U. S. and Alaska
		105 . .	Chart 6 - Canned Packs of Selected Fishery Products
		106 . .	Chart 7 - U. S. Fishery Products Imports
		107 . .	RECENT FISHERY PUBLICATIONS:
		107 . .	Fish and Wildlife Service Publications
		109 . .	Miscellaneous Publications



TECHNIQUE FOR MASS-MARKING FISH BY MEANS OF COMPRESSED AIR

A promising new method for mass-marking fish has been developed. It obviates time-consuming individual handling. A luminous polystyrene ("Derbylite") is applied with sandblast and paint spray guns (using a pressure of 80 to 100 p.s.i.) to fish held in dip nets. The fluorescent fish are detectable under a vapor lamp. The lasting quality of the polystyrene is unknown, but according to the author all indications are that it is permanent. (A Technique for Mass-Marking by Means of Compressed Air, by C. F. Jackson, Technical Circular No. 17, New Hampshire Fish and Game Dept.)

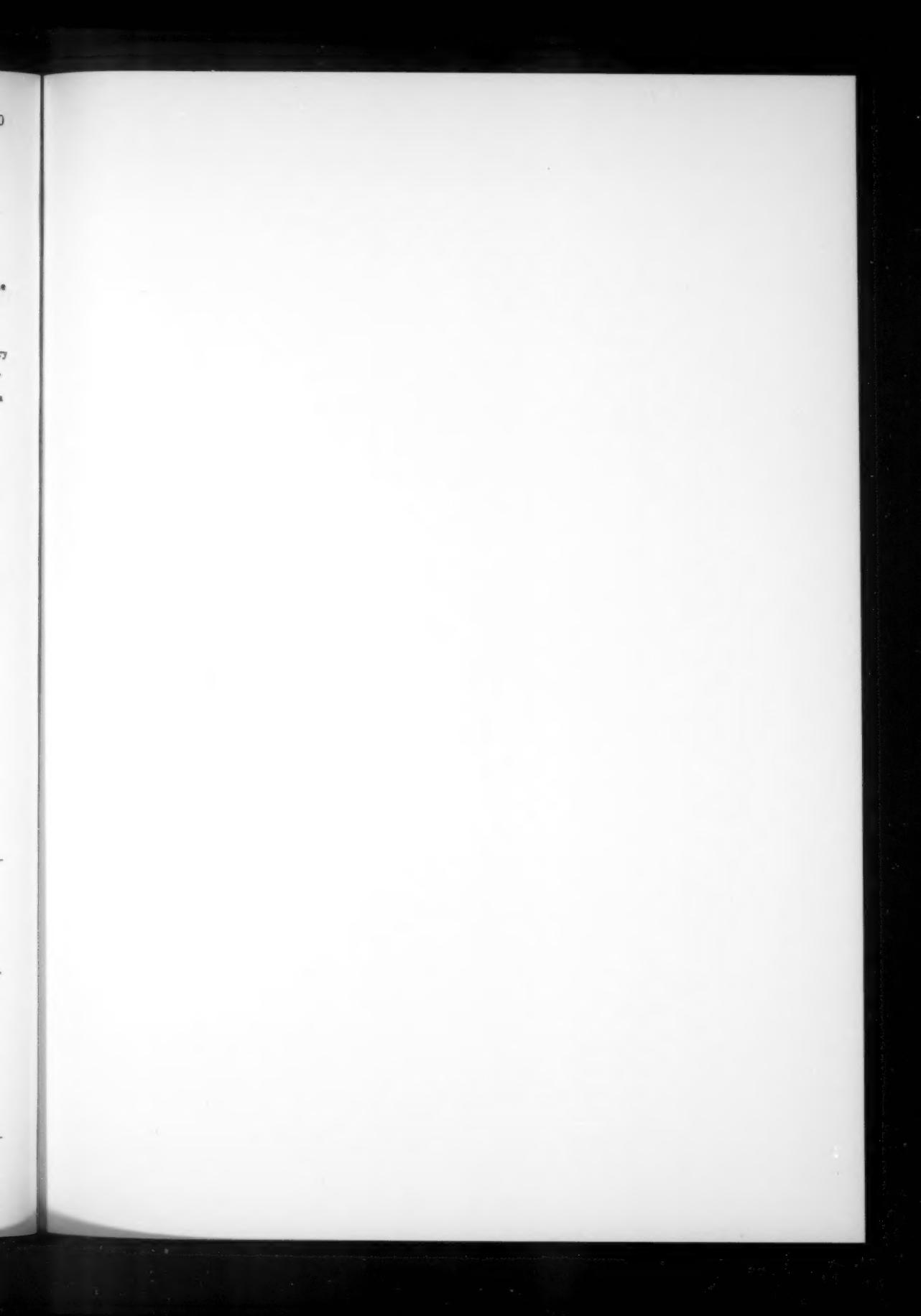
Editorial Assistant--Ruth V. Keefe

Compositors--Jean Zalevsky, Alma Greene, Janice Poehner, and Nyoka Taylor

* * * * *

Photograph Credits: Page by page, the following list gives the source or photographer for each photograph in this issue. Photographs on pages not mentioned were obtained from the Service's file and the photographers are unknown.

Cover--R. K. Brigham, Biological Laboratory, Woods Hole, Mass.; p. 1--J. Thompson; p. 5, fig. 5; p. 6, figs. 7 and 8; p. 7, fig. 9; p. 8, fig. 10; p. 9, fig. 11a, b, & c; p. 10, fig. 12--J. B. Rivers, Pascagoula, Miss.; pp. 18, 20, 22, and 25--Walter H. Stolting; p. 36, fig. 2--Coast and Geodetic Survey; p. 47--J. Pileggi; p. 55--J. O. Traug, FAO; p. 60--Icelandic Freezing Plants Corp. and F. L. Cyprien, FAO.



A photomontage of many of the reports currently released by the Branch of Market News, Bureau of Commercial Fisheries.

